



APA: contents and perspectives

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Abstracts

ORAL PRESENTATIONS

TAKING OVER A SPECIALISED INSTITUTE WITH ADAPTED CYCLING AN EXPERIMENT IN AMIENS

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Key words: Cycling, Adapted Physical Activity, Cerebral Palsy, therapeutic benefits of cycling, education.

Introduction

Cycles into Centers of Motor Education provide to the Adapted Physical Activity professional an opportunity to structure an individualised activity crossing several fields. Adapted to children with Cerebral Palsy, cycling basics can help develop and restore motor reflexes and functions, educate to road safety (essential to consider outdoors trip), and join the Paralympic movement.

Within the framework of a two-school-year collaboration between The Sport Faculty of Amiens and the St-Exupéry Institute, we will introduce you our experiment of young APA teacher through the adapted cycling activity we organised during our 2nd and 3rd year Bachelor.

2006-2007 project: Cycling to readapt

To validate the hypothesis of therapeutic benefits to cycling, the job was focused on cycling contribution to walking efficiency. This study compared 2 groups of CP (8 cyclists matching in age and disability level with 8 control [without sport]) at the beginning and the end of an 8-week series of sessions. Six functional tests evaluated *walking, coordination, sprint, balance, strength* and *stiffness*. After 8 weeks, results showed significative progress for the Cycling group versus the Control group [1].

2007-2008 project: Cycling to educate

This project was based on learning a responsible road behaviour. From recreational group situations, an approach to “road safety” contributed to make the children aware and respect both codes and rules while calling upon their attention and concentration.

Collaborating with Amiens’ Police Department, we set ability tests (*cycle command, traffic knowledge* and *road safety rules*). The first tests revealed strong or low lacks depending on the cerebral affection. A final test has been conducted in May on a city road-education track, delivering an ability certificate.

Next year, along with this work the aim is to prepare the children to sporting event such as time trial.

Conclusion

Cycling is an energetic activity enabling CP’s disability to be compensated. Movement speed mastering and road safety rules knowledge gives to CPs the opportunity to go outside their usual institute surroundings, and to a larger extent “easy ride”. In a more sporty way, the activity can give rise to participation projects in disabled events. Our experience also shows the necessity to add an Adapted Physical Activity professional to the therapeutic and educative team of the St-Exupéry Institute.

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WEARABLE TECHNOLOGY FOR THE MONITORING OF MOTOR ACTIVITY

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Key words: motor activity, wearable technology, rehabilitation.

In recent years the need for monitoring motor activity outside of the laboratory during daily life activity has emerged. The development of miniature sensors has increased sharply the possibility to monitor functional motor activities of patients over extended periods of time also outside the clinical environment, thus providing information on the impact of clinical interventions on real life activities.

A number of wearable devices for clinical applications in rehabilitation and sports medicine have been developed. The compact and lightweight characteristics of these advanced devices for monitoring motor activity allow them to be used with real-time computer control of the recorded parameters.

The focus was initially on using accelerometers or a combination of accelerometers, electrogoniometers and electromyographic sensors to capture movement and muscle activity patterns associated with a given set of functional motor tasks. Accelerometers measure both static and dynamic acceleration. Three accelerometers can be easily incorporated into a single device, thus providing information on three-dimensional movement (tri-axial). They are currently used mainly in research settings; however, with recent advances, incorporation into clinical practice is feasible. Nowadays their most common clinical applications are in gait and balance evaluation, fall risk assessment, and mobility monitoring. Together with the evolution of these systems, the possibility of using wearable technology to assess the quality of movements while the patient performs functional tasks has motivated the realization of innovative and unobtrusive technology where sensing elements are embedded into garments such as gloves, leotards, or knee bands. Spandex fabric (Lycra) with sensing apparatus based on electrically conductive elastomers that give the fabric piezoresistive properties related to mechanical solicitations are the most recent proposal. The “new era” of wearable technology involves integrated systems that work as rehabilitation devices.

Research studies have been focused on integrating wearable technology with orthoses, prostheses, and mobility assistive devices. Three groups of devices will be described: a transportable continuous passive motion elbow device, a wearable electro-rheological fluid based knee resistance device, and a wearable electrical stimulation and biofeedback knee brace.

The experimental data obtained in a group of obese patients by a new portable device for evaluation of human daily physical activity (Intelligent Device for Energy Expenditure and Activity (IDEEA)) will be presented.

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- Mavroidis C. et al., *Smart portable rehabilitation devices*, J NeuroEngineering Rehabil 2005, 2: 18.

THEORY AND PRACTICE IN THE ITALIAN MODEL OF INCLUSION: CONTACT, COMMUNICATION, COLLABORATION AMONG PEERS, COPING, RESILIENCY

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Key words: inclusion, collaboration, communication, contact theory, coping, resiliency.

Introduction

A brief historical illustration is given to comment upon the situation in Italy, where since 1975 there has been full integration in schools of all levels, from kindergarten to university. Special schools no longer exist. Data from MIUR (Ministry for University Education and Research) on the number of differently able pupils in normal classes and on the number of support teachers show that the situation is now stable.

The importance of the legislative framework concerning a family's right to demand that their differently able child be enrolled in a school belonging to the normal system is stressed. This right must correspond to an obligation on the part of the school to accept such pupils. In countries where this right/obligation does not exist it is very difficult for full and effective school integration to be achieved. In Italy this obligation of acceptance by schools is established by law and it exists an educational continuity during the transition from one school to another (kindergarten/elementary/primary/ secondary school). It is a system prevalently of the pedagogic type and operates in collaboration with a medical team.

After 35 years of school integration, it is now possible to reflect on the situation and on the changes that have come about: changes have occurred in terms of language, of social acceptance, and of the initiatives taken in particular with regard to physical activities and sports. It may be postulated that, through school inclusion, we have achieved social inclusion.

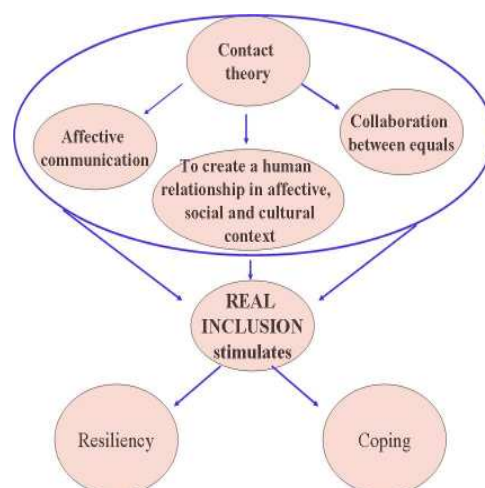
The model

We may now examine on the concepts that comprise the theoretical foundation of the model that has been put in place: *contact theory* (Alport, 1954; Sherrill, 2004), *communication* (Gordon 1991; Rogers, 1980, *collaboration among peers* (Block&Zeman,1995; Hutzler & al, 1997; Sapucci, 2005). These are inter-linked facets that must be logically integrated to achieve true inclusion; actions and proposals that must be induced and put in place by those surrounding the differently able child within a specific environment (school, social group, sports club) so as to stimulate individual mechanisms of reaction and response in the child: *coping* (Lazarus Opton, 1966, *resilience* (D.Janes M. Tortello, 1999; Di Brotini et al, 2001)

The result of the succession and integration of these stimulatory mechanisms (contact, communication, collaboration) and response mechanisms (coping and resilience) facilitate effective inclusion.

The presentation illustrates these theoretical aspects and their concrete form in practical class-work and physical/sports activities, including short films of some examples.

To conclude it must remember that politicians and public administrators possess the key to achieve school and social inclusion: in Italy they played a decisive part with the help of associations and trade union.



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MAXIMAL AND SUBMAXIMAL TREADMILL TESTS IN A YOUNG ADULT WITH A FRAGILE-X SYNDROME

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Key words: Fragile X, physical test, hormonal and metabolic responses.

Introduction

Fragile X syndrome is associated with expansion of a repeated triple CGG sequence of the FMR-1 gene, resulting in absence of production of FMRp protein. The consequences of this abnormality expressed in neuro-endocrine disorders (adrenal axis / macro-orchidism) and in the emergence of significant behavioural stress.

Research Methods

The authors report a hormonal study of one clinical case in a young adult with a X-fragile syndrome, focusing on the catecholamines and cortisol adaptations during a treadmill submaximal test.

This patient showed significantly higher concentrations of epinephrine and norepinephrine concentrations; and cortisol levels were higher than the laboratory standard during the submaximal incremental test.

Discussion

The most important result of this work is the one of the catecholamines and cortisol variations during the submaximal incremental test. In this young FraX adult, in comparison with control subjects, we can observe hormonal variations that were much premature and ample during physical exercise; particularly catecholamines quickly rised, reflecting the "stress" effect induced by the physical exercise. Cortisol elevations were very significant from the beginning of the exercise test, and much larger than for controls subjects. Hessler et al. (2002) supported this result and demonstrated that children with FraX, had higher levels of salivary cortisol during cognitive and social challenge tasks. Hagerman et al. (1996) had already raised this possible overactivity of the sympathetic nervous system in these patients in response to environmental stimuli, and the Miller study conducted in 1999, using a direct electrophysiological measure of electrodermal responses to stimuli was a clear indication of this overactivity (Miller et al. 1999).

Conclusion

Despite the relatively consistent links between *FMR1* gene function and outcomes in fragile X, considerable variability in stress-related behaviour problems exists. This variability can in part be explained by non-genetic factors, such as characteristics of the home environment and the effectiveness of educational and therapeutic services.

Although there was a significant "stressful" effect of the submaximal incremental test, this young adult did not demonstrate harm-avoidance adaptation or even refusal, as evidenced by the quality of VO_{2max} values achieved at the end of the submaximal incremental test.

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APA AND PSYCHOGENIC OBESITY: A CLINICAL EXPERIENCE

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Key words: Eating Disorders, Obesity, Physical Activity, Psychiatric Diseases.

Obesity is a chronic multifactorial condition in which excess body fat may expose the individual to serious health risk and to severe alteration of the psychosocial functioning and quality of life. Moreover, it can be associated with disordered eating, as overeating or binge eating disorder, depression, low self-esteem and impulsivity. This coexistent psychopathology may worsen the treatment outcome and produce early relapse.

Basic treatment of obese patients requires a comprehensive approach involving diet, regular physical activity, cognitive and behavioral changes, with an emphasis on long-term weight management rather than short-term excessive weight reduction (Annesi, 2007; Dietz, 2004). The intrinsic motivation is one of the most important factors supporting the compliance with patients in treatment. The motivation to physical activity and the change in the attitude of patients towards physical experience and physical self-efficacy are determining elements of the weight control treatment success (Berger, 2004).

The aims of this communication are to present the main characteristics of our program and the clinical results of an intervention in a sample of obese psychiatric inpatients.

Methods

In a clinical psychiatric setting, we have been running a program of adapted physical activity for overweight and obese in-patients with psychiatric symptomatology. We have developed a specific multidimensional program for these patients including an energy-restrict diet, individualized physical activity daily program, nutritional education, together with individual and group cognitive-behavioral psychotherapy.

Results

Our sample consisted of 35 inpatients (5 male e 30 female) with a mean age of 37,5 years (SD=14,4). The most frequent psychiatric diagnosis were Binge eating disorders and Borderline PD. On the basis of the BMI estimate 5 presented an overweight, 9 were in obesity class I, 7 were in class II and 14 were in class III. The mean BMI was of 39.23 kg/m² (SD=8.5). Results have been evaluated with several tools, including: bio-medical parameters, improving BMI, psychometric scales (SCL-90, University of Rhode Island Change Assessment Scale, Dieter's Temptations of Eating Inventory, Body Image Avoidance Questionnaire, SF-36, Borg scale), physical measurement, recording of fitness performance, and specific observation for physical activity patterns. The results obtained so far are compatible with the recommendations of the international guidelines for the cure of obesity(NHI, 1988): the mean weight loss was 5.9 kg corresponding to 5.5% of the initial weight.

Our findings lead us to support that APA could be an important functional element within a multidimensional therapy program aimed at the treatment of obesity with psychiatric co-morbidity.

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DEAMBULATION CONTROL IN PARKINSONISM THROUGH EMISOME NEUROMOTOR ACTIVATION

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Key words: global proprioceptive, Ssectorial neuromotor activation and emisome.

Introduction

The Parkinson's disease is a progressive chronic disorder of the extra pyramidal system, more frequent in aging people but often affecting younger adults as well. Typical manifestations of the disease are the reduced body kinesis, anaemia and tremor. Limited ambulation results in serious disadvantage for the patient, from both a psychological and physical point of view.

Objectives

The aim of doing this is to improve neuromotor control on lower limbs and to overcome the virtual barrier of freezing.

Methodology

The treatment of the disease this paper would like to present basically rests on two phases (1) a global, proprioceptive phase, in which postural balance is developed through perception improvement; (2) a sectorial, neuromotor activation phase, which aims at gaining control of neuromotor activity in the body side opposite to the affected side.

Results

After an average of 10 sittings (range 3-15), all patients improved their social life and achieved independence from anybody's physical help.

Conclusions:

30 patients were treated by the presenter from 1993 to date (20 women and 10 men), their average age being 60 (range: 55-76), all of them from Northern Italy, with reduced ambulation from Parkinsonism, and all of them having suffered from the Parkinson syndrome for an average of 5 years (range 3-7). Treatment went through sittings of 50 minutes each.

The treatment used by the presenter has proved easy to be learnt and put into use, and easily applied to other cases, apart from the seriousness of the disease or its long-lasting course.

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DISABLED STUDENTS INCLUSION AND INTEGRATION: QUALITY INVESTIGATION ABOUT PHYSICAL EDUCATION TEACHERS PERCEPTION

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Introduction

In Italy, the physical education (PE) subject is included in the compulsory syllabus from primary to secondary school (students aged 3-19 years). The Educational Special Needs (ESM) and student with all disabilities are included and integrated in the regular schools by Italian laws from 1971-1977. The PE teachers in the secondary schools (students aged 11-19 years) are specialist and they attend at the Motor and Sport Science Faculty (3 years for Bachelor+2 years for Master) and then they attend for national certification at School of Specialization for secondary school teachers (SIS) (2 years). (Council of Minister of Europe-Process of Bologna 2000).

Issues

The survey want to investigate the PE teachers perception about inclusion and integration of disabled students (DS) in the PE classes. The questions concern what they think about: a) teaching in inclusion of DS in the regular PE classes; b) teaching in the special PE classes.

Research methods

The survey is qualitative, data are collected by interviews, with descriptive statistical analysis (means, frequency, standards deviation, percentage).

Results

The sample consist of 220 subjects (124 female; 96 male); ranged in the age from 20 to 51, with mean age 35 years. The perception about inclusion and integration of disabled student in:

- a. PE regular classes is positive 85.1%, (motivation: opportunity for development of motivation; social emancipation; inter-personality relationship; dignity; personality; social skills; motor skills with individualization; adaptation, simplification; graduality; special training for teachers; special instrumental for integration; comprehension of disabilities person from other people; whereas more complex organization; no-homogeneity workgroup; disabled students is a burden for other students)
- b. PE special classes is positive 14.2%, (motivation: more simple organization; homogeneity workgroup; more specialization of teachers and instrumentals; more focus on the disabilities problems and rehabilitation; whereas no opportunity for development of: motivation, social emancipation, inter-personality relationship, personality, social skills, free life; segregation and marginalization)
- c. other possibilities 0.1%, (motivation: alternation of phases/time in regular and special schools; low-medium disabilities students in the regular schools and seriously disabilities in the special schools).

Discussion

The trend about the majority is represented by positive thinking of inclusion and integration in the regular schools, whereas the negative thinking are minority. This probably due development of democratic pedagogical culture and the legislation of the last 30 years in the Italian society.

Conclusion

The inclusion and integration in special environment is more characteristic in medical and rehabilitation approach by sanitary department, whereas inclusion and integration in regular environment is more pedagogical approach in educational department, and both take part in DS life project by a multi-factorial and multi-modal educational model.

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BIOFEEDBACK-BASED TRAINING PARADIGMS FOR BALANCE

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Keywords: balance, biofeedback, training, wearable sensors.

The improvement of balance ability and consciousness is an important point for reducing falls and increasing the quality of life. Increased body awareness and position sense is necessary to compensate functional limitation in balance disorders but also to maximize sport performance. Balance improvements may be achieved by adding artificial sensory information (sensory augmentation or substitution) that enlightens the brain about actual body posture and movements. This information may be coded into an appropriate sensory signal and conveyed to the user in real-time; in this case, brain and muscle activities, that are not normally controlled voluntarily, may be changed accordingly to the new information available. This is a typical example of biofeedback (BF), a training technique in which people are taught to improve their health and performance by using signals quantifying their own bodily functions.

Interest in BF has waxed and waned since its inception in the 1960s; it is, however, undergoing something of a renaissance during the early 21st century. For example, it has been demonstrated that physical activity based interventions, including BF therapies, can improve functioning in older people. In specific elderly populations, such as older fallers and patients with Parkinson's disease, there is evidence that interventions may improve both cognitive and motor functions. Available results suggests more effect when interventions take place over longer time periods, when they are individually tailored, and include exercises in the home environment (Ashburn et al., 2007).

During motor rehabilitation, therapists favour sensory integration by augmenting sensory information. Recent technological advances introduced miniature sensors and actuators and microelectronic systems, to produce a virtual therapist that can effectively monitor older people in their home environment and manage BF-like interventions that are tailored to individual needs (Chiari et al., 2005, 2008).

We designed several biofeedback devices able to convey augmented motor information via the ears or the eyes to the users. Motor information was sensed with portable sensors such as accelerometers or instrumented-insoles. A laptop computer or a palmtop was used to visualize, or modulate into a sound, the additional motor information.

We found that audio-BF of trunk acceleration decreased sway during stance proportionally to the extent of missing sensory information, and that subjects with sensory loss may benefit more than controls from BF systems.

We also observed as muscle activity and the level of co-contraction among leg muscles were not significantly different in trials with and without BF, suggesting that with BF the CNS is able to optimize performance without increasing muscular stiffness.

Depending on the BF coding and representation, the user may achieve different level of performance and choose different strategies for the control of posture.

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THE APPLICATION OF AN ADAPTED PHYSICAL ACTIVITY INTERVENTION PROGRAMME FOR CHILDREN WITH AUTISM AND CO-OCCURRING LEARNING DISABILITIES

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Key words: motor activity, wearable technology, rehabilitation.

In recent years the need for monitoring motor activity outside of the laboratory during daily life activity has emerged. The development of miniature sensors has increased sharply the possibility to monitor functional motor activities of patients over extended periods of time also outside the clinical environment, thus providing information on the impact of clinical interventions on real life activities.

A number of wearable devices for clinical applications in rehabilitation and sports medicine have been developed. The compact and lightweight characteristics of these advanced devices for monitoring motor activity allow them to be used with real-time computer control of the recorded parameters.

The focus was initially on using accelerometers or a combination of accelerometers, electrogoniometers and electromyographic sensors to capture movement and muscle activity patterns associated with a given set of functional motor tasks. Accelerometers measure both static and dynamic acceleration. Three accelerometers can be easily incorporated into a single device, thus providing information on three-dimensional movement (tri-axial). They are currently used mainly in research settings; however, with recent advances, incorporation into clinical practice is feasible. Nowadays their most common clinical applications are in gait and balance evaluation, fall risk assessment, and mobility monitoring. Together with the evolution of these systems, the possibility of using wearable technology to assess the quality of movements while the patient performs functional tasks has motivated the realization of innovative and unobtrusive technology where sensing elements are embedded into garments such as gloves, leotards, or knee bands. Spandex fabric (Lycra) with sensing apparatus based on electrically conductive elastomers that give the fabric piezoresistive properties related to mechanical solicitations are the most recent proposal. The “new era” of wearable technology involves integrated systems that work as rehabilitation devices.

Research studies have been focused on integrating wearable technology with orthoses, prostheses, and mobility assistive devices. Three groups of devices will be described: a transportable continuous passive motion elbow device, a wearable electro-rheological fluid based knee resistance device, and a wearable electrical stimulation and biofeedback knee brace.

The experimental data obtained in a group of obese patients by a new portable device for evaluation of human daily physical activity (Intelligent Device for Energy Expenditure and Activity (IDEEA)) will be presented.

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- Mavroidis C. et al., *Smart portable rehabilitation devices*, J NeuroEngineering Rehabil 2005, 2: 18.

THE INFLUENCE OF REGULAR EXERCISE ON OLDER WOMEN'S SELF AND QUALITY OF LIFE

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Key words: older adults, exercise, Physical Self Perception Profile, Quality of Life.

The Physical Self Perception Profile (PSPP) measures physical self-reported perceptions and was originally developed by Fox and Corbin (1989) with American students. The PSPP has been submitted to different validation studies with other languages rather than the English and used with different groups. Sonstroem, Speliotis and Fava (1992) used the PSPP with older adults and suggested that further development was needed for this particular group. Recently Fox, Stathi, McKenna and Davis (2007) proposed the PSPP clinical version – PSPP-SC for older population.

The main purpose of this study was to examine the hierarchical structure, reliability and validity of the Portuguese version of the PSPP-SC (PSPP-SCp). The instrument was administrated to 237 Portuguese elderly adults (129 women and 108 men) mean aged 74,85±7.66 years. Male participants showed higher mean score values in all PSPP-SCp domains when compared with female. Principal components analysis showed that the original six-factor structure was not fully supported in both genders. Body Attractiveness and Physical Strength sub-domains in females and Body Attractiveness and Physical Health sub-domains in males were clearly defined. Cronbach Alpha values ranged from 0,62 to 0,76 for females and 0,62 to 0,85 for males showing an acceptable to good internal consistency. Zero order and partial correlation coefficient did not confirm the hypothesised hierarchical organisation of constructs with Physical Self-Worth functioning as a mediator between PSPP-SCp subscales and Global Self-Esteem in males, however this hierarchical organization was confirmed in females. Multiple regression revealed that Functionality, Physical Strength and Body Attractiveness sub-scales explained 38,9% for female and 65,6% for male of the total of variance. Further studies are recommended.

A second purpose of this study was to assess the effects of regular physical exercise in older women's Self and Quality of Life through the assessment of variables such as Global Self-Esteem, Physical Self-Perceptions, Satisfaction with Life, Subjective Well-being and Perceived Stress.

Exercisers showed higher mean scores values for Functionality and Physical Strength then non exercisers. No differences were found in Satisfaction with Life or in Global Self-Esteem among these groups. Results also revealed that Body Attractiveness was positively related with Exercise and that it seems to exist a weak or no relation at all between Exercise and the variables used to assess Quality of Life (Satisfaction with Life, Subjective Well-being and Perceived Stress).

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THE CAWTHORNE AND COOKSEY PROGRAM APPLIED IN PREVENTION OF FALLS IN OLDER PATIENTS: PRELIMINARY STUDY

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Introduction

Human species is predisposed to fall; this fact increases with age because of many factors like accidental and environmental causes, balance trouble, muscular weakness, mental disorder, sight problems, and so on.

Falls may have serious consequences for old people's life: in fact they can represent the passage from an independent to a dependent existence.

The loss of the balance capacity represents the second reason of fall in older people: in fact it coincides with the 17%. Consequently, a balance exercises program could reduce the likelihood of fall.

This search wants to adapt one of the current scientific balance exercises programs, the Cawthorne and Cooksey program, to older people to produce an effective reduction of their risk of fall.

Elaboration methods

For this search we used 100 subjects as sample (aged 60 – 75), divided in two equal parts: the control and the experimental group.

From scientific test to value balance capacity we selected the Standind Balance Test by Bohannon. We changed some parts of the original test to adapt it better to our sample subjects.

We administered the test at the beginning, after 30 days and after 60 days from the starting of exercises program.

Results

From our outcomes we can say:

- Balance capacity can also improve without a specific exercises program;
- The Cawthorne and Cooksey program offers a better improvement in balance capacity as regards to general motor activity.

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RECOMMENDATIONS FOR OPTIMAL ELECTRODE POSITIONING TO ACQUIRE HIGH QUALITY SURFACE EMG FROM MEDIAL GASTROCNEMIUS AND UPPER TRAPEZIUS MUSCLES

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Key words: High density EMG, Conduction velocity, Gastrocnemius medialis, Upper trapezius, Biofeedback.

Introduction

The use of surface electromyography (sEMG) in clinical and research fields has been growing in the last decades, mostly without standards. Many suggestions [1] are now obsolete because of the advent of multi-channel and bi-dimensional sEMG detection systems. Electrode positioning is a critical issue for obtaining good sEMG records and should be addressed according to specific muscles and tasks. This study provides guidelines concerning electrode positioning to record high quality sEMG signals from gastrocnemius medialis (GM) and upper trapezius (UT) muscle.

Methods

EMG signals were collected from different locations over the UT muscle of 20 subjects and the GM muscle of 10 subjects. A matrix of 64 electrodes (8mm IED) was positioned on the UT muscle half way between acromion and C7, whereas two arrays of 8 electrodes (5mm IED) covered two sites of gastrocnemius, defined as *proper* (distal) and *improper* (proximal), in accordance to the inclination and the degree of overlapping of GM fibers, as observed by ultrasound scanning. Single differential sEMG were recorded with torque and force (exerted by GM and UT, respectively) during isometric contractions of 10s at 30% and 70% of the maximal voluntary contraction (MVC). Conduction velocity (CV) values were estimated from single differential signals [2] for non-overlapped epochs of 0.5s, and used to identify GM portions that provide propagating sEMG signals. Maximum RMS and minimum MNF values were estimated from maps of sEMG distribution on UT muscle, according to its division into four portions: cranio-medial and -lateral and caudal-medial and -lateral.

Results

Estimates of CV in the *improper* and *proper* locations were higher than 100 m/s and 6 m/s with a coefficient of variation (COV) of 200% and 15%, respectively. CV estimated for UT had a mean \pm std of 6.62 \pm 1.98 m/s (N=40; 20 subjects x 2 contractions). The highest value of the RMS map and the lowest values of the MNF map were observed in the cranio-lateral quadrant in 70% and 40% of the contractions, respectively.

Conclusions

The GM distal portion provides propagating sEMG potentials with CV closer to the expected physiological value. The cranio-lateral quadrant of UT proves to be the most suitable portion for good sEMG recordings.

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PHYSIOLOGIC PARAMETERS AND SPECIFIC WHEELCHAIR BASKETBALL SKILLS OF A TEAM ALONG COMPETITION SEASON

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Key words: testing, aerobic capacity, anaerobic capacity, skills proficiency.

Introduction

An elite wheelchair basketball team was assessed before and at the top of the competition season. In both test sessions were evaluated physiologic parameters (PP: aerobic, anaerobic, alternating aerobic-anaerobic metabolism, upper muscles strength) and specific wheelchair basketball skills (SWBS). Aim: evaluating improvements in PP, SWBS and the relationship between them.

Research Methods

Eleven male players, mean age 32 ± 7 years, body mass 76 ± 12 kg, height 1.8 ± 0.1 m, performed an incremental protocol, at arm-cranking ergometer, to evaluate maximal oxygen consumption (VO_{2max}) and heart rate (HR) using a metabolimeter. To assess the anaerobic capacity, a 30 second sprint test was adopted (adapted from Vanlandewijck). Dal Monte 5 sprints test was used to evaluate alternating aerobic-anaerobic metabolism. Assessment of upper muscles strength consisted of: 4 kilos ball throwing test, bench press and lat machine 1RM. Six field tests were used to assess basketball skills: lay-up (LU), figure-eight (F8), figure-eight + ball (F8+B), 20 meters sprint (20mS), zone-shot (ZS), pass for accuracy (PFA). Statistical analysis. ANOVA analysis was performed. Statistical significance was set for $p \leq 0.05$.

Results

The team slightly improved its VO_{2max} : from 33.6 ± 6.2 to 34.9 ± 6.7 ml/min/kg. Significant improvements were observed for: anaerobic power (from 99 ± 13 to 101 ± 13 m); aerobic-anaerobic metabolism (3th min recovery HR: from 101 ± 7 to 95 ± 4 beats/min); strength (ball throwing: from 5.03 ± 0.9 to 5.15 ± 0.9 m; bench press: from 70 ± 19 to 76.4 ± 19 kg; lat machine: from 60.4 ± 16 to 67 ± 17 kg). Relating to SWBS, significant improvements were observed in: LU (from 28 ± 4 to 30 ± 4 score); F8 (from 18 ± 1 to 19 ± 1 score); 20mS (from 5.6 ± 0.5 to 5.5 ± 0.5 s); PFA (from 17 ± 7 to 20 ± 7 score); ZS (from 30 ± 6 to 32 ± 7 score). Among SWBS, in both test sessions, significant correlations were observed between: F8+B and all PP; 20mS and anaerobic power and muscle strength; PFA, ZS and muscle strength.

Conclusion

These results suggest that: improvements in PP and SWBS can be obtained also in an elite team along the competition season; SWBS are prevalently correlated with muscle strength. Thus players could profit by paying particular attention to strength training.

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MOVEAT – AN OUT-PATIENT PROGRAMME FOR OVERWEIGHT YOUNG PEOPLE WITH DOWN SYNDROME AND THEIR FAMILIES

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Key words: persons with Down Syndrome, overweight, physical activity, nutrition, eating and moving behaviour.

Introduction

Recent studies on health of children and adolescents suggest that 15% of German children between 3 to 17y are evaluated to be obese (Kromeyer-Hausschild & Wabitsch, 2007). In Austria male pupils between 6 to 14y have too much weight (obesity and/or overweight) at a rate of about 20%, females of the same age group by about 18% (Zwieauer, 2007). American publications give a still worse initial status for individuals with Down Syndrome (DS). Rubin et. al (1998) suggest a prevalent rate of 45% of male and 56% of female persons being over weighted. Given this context and the additionally known individual circumstances of adolescents with DS – with respect to individual development, increased risk of coronary disease or other associated medical conditions, and special educational and social problems – the importance of health enhancing projects and initiatives is considered to be urgent.

Project Description

Initiated by the DS-Ambulanz in Vienna and by cooperation of the associations GEFÖ (Gesundheitsförderung Österreich), ZSW (Centre for Sports Sciences and University Sports, University of Vienna) and AFAPA (Austrian Federation of Adapted Physical Activity) - the project “MOVEAT” was created. MOVEAT is a long-term intervention programme for persons with DS – at the moment only 5 women between 18 and 32y participate. The participants meet once a week for three hours. They commit 90 minutes to movement and 90 minutes to schooling about nutrition. Both parts are using very practical activities - moving, playing, cooking and eating selected meals. The main aims are:

- stabilisation/ reduction of the weight
- improvement of eating and moving behaviour
- empowerment for self responsibility as regards the planning of recreational activities
- individually tuned improvement of psycho-social well-being
- social integration
- medical monitoring

Methods and Evaluation

The didactic intentions of the sport programme try to combine the improvement of motor functioning and emotional development through body awareness and joyful physical activity. The participants are encouraged to express their preferences and to decide about active and recreational parts of the unit. They have been assessed by a Pre-test – a variation of Eurofit Special Test Battery (Skowroński, 1999) in October and will have to undergo a post-test end of June.

The results of the first year are expected to show the development of weight and health conditions (medical monitoring), their improvement of motor abilities (EFSTB), and to document their self reported enhancement of self responsibility and personal well-being (individual interviews).

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PUERTORICAN PHYSICAL EDUCATION PRESERVICE TEACHERS' JUDGEMENTS ABOUT INCLUSION OF STUDENTS WITH DISABILITIES IN GENERAL PHYSICAL EDUCATION CLASSES

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The purpose of this study was to examine preservice teachers' judgements about inclusion of students with disabilities in general physical education (PE). Participants were 55 PE preservice teachers (83%) from the five University of Puerto Rico campuses (Arecibo, Bayamón, Cayey, Rio Piedras, & Mayagüez) that offer a degree in PE who completed the validated Physical Educator's Judgements About Inclusion Instrument (PEJI) (Hodge, Murata, & Kozub, 2002) and were later interviewed as a focus group. Nine questions were used in the interview regarding: (a) special education or adapted physical education (APE) courses, (b) practical experiences, (c) degree type, and (d) program strengths and weaknesses. Participants from Bayamón were completing a degree in APE that includes three APE clinical experiences prior to student teaching, while those finishing a secondary PE (three campuses) or elementary PE (one campus) had only to complete a 3-credit course in adapted physical education with 10-15 hours of field or clinical observations.

Nonparametric statistics were used to compare PEJI results in its three judgement categories (inclusion v. exclusion, acceptance of students with disabilities, and perceived training needs) among campuses. Focus group interviews were qualitatively analyzed to look for common themes. Participants did not differ in their judgements about inclusion versus exclusion, except for those from Bayamón. More than 65% (55% from Bayamón) judged that all students with disabilities must be included in general PE. Participants from four campuses (50% from Bayamón) felt that students with severe disabilities should receive separate PE. All had strong acceptance of students with disabilities and felt they needed more courses, clinical experiences and training in inclusion. All participants (except from Bayamón) felt unprepared to teach PE to individuals with disabilities, in agreement with Kudlacek, Volkova, Sherrill, Myers, & French (2002) who found that Czech APE majors perceived themselves as more competent than general PE majors.

Qualitative analysis of the interviews yielded three common themes: (1) Participants did not feel prepared to teach individuals with disabilities in inclusion; (2) Participants (except from Mayagüez) felt prepared to teach general PE; and (3) Participants, except those from Bayamón felt their current degree program was deficient in providing practical experiences teaching PE to individuals with disabilities.

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ATHLETIC IDENTITY, SELF-ESTEEM, PHYSICAL SELF AND SUBJECTIVE WELL-BEING IN PORTUGUESE ATHLETES WITH DISABILITY

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Key words: Athletic Identity, Self-Perceptions and Disability Sport.

Introduction

Athletic identity is defined as the degree to which an individual identifies with the athlete role and looks to others for acknowledgement of that role (Brewer, 1993). According to Van de Vliet, Van Biesen, and Vanlandewijck (2008) athletic identity is related to health and physical fitness, self-esteem, social relationships and confidence as well as participation in physical activity and exercise. Research in individuals with disability revealed athletic identity as a important component of self-concept which was analysed on the premise that sport-related psychological benefits such as self-esteem, physical self and subjective well-being would be manifested most strongly in athletes whose self-concepts were strongly tied into the athlete role (Martin, 1999). The purpose of this study was to investigate athletic identity, global self-esteem, physical self-perceptions and subjective well-being in Portuguese athletes with disability and assess hypothesised relationships between variables.

Methods

Participants were Portuguese athletes with disability (N=37), 13 female (24.15±6.16) and 24 males (28.83±6.62), competing at two different levels: regional/national (RNL) and international/paralympic (IPL). All participants were assessed using Portuguese versions of the following instruments: Physical Self Perception Profile, Rosenberg Self-Esteem Scale, Athletic Identity Scale, Satisfaction with Life Scale, the Leader Scale and Perceived Stress Scale.

Results

RNL athletes reported higher levels of self-esteem, physical self-worth and physical strength whereas IPL athletes reported higher levels of physical confidence and body attractiveness, higher levels of satisfaction with life (both in general and at the moment) and perceived stress as well as higher levels of athletic identity (both global and in the four sub-domains). Comparison between groups revealed significant differences for physical strength (U= 102.5, p<.05), for the four dimensions of athletic identity: social identity (U= 54.0, p<.01), self identity (U= 12.5, p<.01), negative affectivity (U= 58.5, p<.01) and exclusivity (U= 26.5, p<.01) as well as for the overall value for global athletic identity (U= 29.0, p<.01). Marginal values were also found for physical self worth (U= 112.5, p=.073) and perceived stress (U= 107.5, p=.055) that due to the small sample size should be considered in future studies.

Discussion

Portuguese IPL athletes possess a strong positive athletic identity, perceived self and subjective well-being in which they identify themselves as being 'real athletes'.

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REPEATABILITY OF PHYSIOLOGICALLY SIGNIFICANT PARAMETERS DURING A STABILOMETRIC TEST ON TECNOBODY PROKIN PLATFORM

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Key words: repeatability, stabilometric test, Romberg test.

The aim of this study is to test the repeatability of some physiologically significant parameters calculated during a stabilometric test in one-leg and two-leg stance conditions. The study aims also to assess which relation exists between the two tests carried out in the two conditions: open eyes (EO) and closed eyes (EC). Twenty-six persons who regularly practiced sport at a not competitive level were investigated. Using the TecnoBody Prokin platform (PK 214 P) two tests were performed, one lasting 30 s and one lasting 60 s. The calculated variables were: the average movement of the the centre of pressure (CoP) in the frontal plane (mm) and its Standard Deviation (devst ml), the average movement of the the centre of pressure in the sagittal plane (mm) and its Standard Deviation (devst ap), the average speed in anterior-posterior direction (mm/sec), the average speed in medium-lateral direction (mm/sec), the ellipse area (mm²), and the perimeter length (mm) described by the CoP during the test.

In the two-leg stance test the subject was barefooted in standardized position. In the one-leg stance position the subject was asked to use the dominant leg as a support and the other one with the knee flexed at 90°.

The above described protocol was adopted for three nonconsecutive days.

Using the Interclass Correlation Coefficient (that is the variance due to subjects, ICC) and the ANalysis Of VAriance (ANOVA) the variances due to the trials, the days and the subjects were established.

The average speed in ap direction, the ellipse area and the perimeter length appeared the most repeatable variables in the one-leg stance position with EO (60% < ICC < 70%). The ellipse area and the perimeter length resulted the most repeatable variables in two-leg stance EO (60% < ICC < 70%). In OC conditions no variable was found repeatable (ICC < 60%).

The devst ap, the devst ml, the average speed in ap direction, the average speed in ml direction, the ellipse area and the perimeter length showed standard error of the mean in the range 5%-10% in all tests.

Average speed in ap direction vs perimeter length, average speed in ml direction vs perimeter length, devst ap vs ellipse area, and devst ml vs ellipse area were found to correlate ($r > 80\%$ and $p < 0.05$.)

Postural control was found worse in EC condition for all test ($p < 0.05$).

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EVERY DAY WHEELED MOBILITY SKILLS SURVEY – A PILOT STUDY AMONG SCI ATHLETES

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Key words: hand rim wheelchair, mobility, survey, ADL wheelchair skills, spinal cord injury.

Wheeled mobility skills (WM) are key to daily functioning, and assumed to contribute to participation and quality of life of people with spinal cord injury (SCI). Measurement of WM can assist in diagnosis and monitoring of functional wheeling capacity, in the choice of skills to be trained in rehabilitation and allows evaluating systematic training interventions.

Objective

To develop a standard WM test, a survey among wheelchair athletes was initiated to collect SCI athletes' opinions regarding the most essential skills for everyday life and to find out where they learned to perform these skills. The result of this pilot provides valuable feedback for refinement of the WM survey prior to testing at 2008 Paralympics.

Methods

Survey development was iterative. Finally, a list of 24 skills was presented. For all 24-items, the respondents were asked to state the essentiality of the skill (1-5 scale: Not essential at all to Extremely essential), and they were asked where they learned to perform each skill. In addition, they described the level of WM gained during their rehabilitation period (1-5 scale: Poor to Excellent).

The survey was piloted with a group of 25 wheelchair basketball players (Paraplegic, males/female: 23/2), playing in the highest league in Britain, USA, Belgium, The Netherlands, Greece and Israel.

Results

Preliminary results on 25 subjects (mean age: 31.6±8.6 yrs; mean time since injury: 14 ±9.9 yrs) are presented. The most essential skills were: transfer into/out of car (4.6±0.9), transfer from floor to wheelchair (4.3±1.3), ascending/descending 5cm sidewalk (4.2±1.0). Judged as less essential skills were: one handed wheelie (2.4±1.6), 20 meter sprint (2.6±1.3), and 5 minutes on a treadmill (2.8±1.5).

48% Of the respondents stated they learned to perform "very essential" and "extremely essential" skills in rehabilitation, while 44% claimed to have learned to perform those skills on their own. The mean score of 'WM skills gained in rehabilitation' was "good" (3.4±1.2). Britain's rehabilitation centers received a "very good" (4.3±1.1), whereas Israeli hospitals were graded "fair" (2.8±1.3).

Discussion & Conclusions

Nearly half of the very essential skills were self-taught. There seems a great importance to incorporate these skills in inpatient rehabilitation or in post hospital WM workshops. It is recommended to conduct a comparative study of rehabilitation programs in different countries in order to improve WM teaching methods. This pilot study provided the research team feedback for designing the final survey.

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EFFECTS OF AQUATIC INTERVENTIONS IN CHILDREN WITH NEURO-MOTOR IMPAIRMENTS: A SYSTEMATIC REVIEW OF LITERATURE

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Purpose

The purpose of this article was to determine the effectiveness of aquatic interventions in children with neuro-motor impairments. A search of electronic databases that included Medline, Eric, PsychLit, PEDRO, SIRC, CINAHL and Cochrane between 1966 to January 2005 was conducted. We searched using the following key words: ‘hydrotherapy’, ‘aquatic therapy’, ‘water exercise’ and swimming”. An additional resource that was attained manually included the Aquatic Therapy Research Bibliography until 1999. Titles and abstracts were assessed manually according to the following inclusion criteria: (1) population (children with neuro-motor or neuro-muscular impairments) (2) intervention (aquatic program). Articles were reviewed according to merit of design, population participants and outcome measures with respect to International Classification of Function and Disability terminology (changes in body function, activity level and participation).

Results

Results extracted 11 articles of the 173 that were retrieved met the inclusion criteria. These included one randomized control trial, two quasi experimental, one cohort study, two case control studies and five case reports. Seven articles reported improvement in body functions, and seven articles reported improvement in activity level. Two of the four articles that investigated outcome measures regarding participation described positive effects while the findings of the other two revealed no change. None of the articles reported negative effects due to aquatic interventions.

Conclusion

According to this review, there is a substantial lack of evidence-based research evaluating the specific effects of aquatic interventions in this population.

APA AND MULTIPLE SCLEROSIS

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Key words: physical exercise, chronic disease, quality of life.

Multiple Sclerosis (MS) is a chronic inflammatory disease of the central nervous system that leads to the destruction of myelin, oligodendrocytes and axons that predominantly affects young adults in their most productive years. MS pathophysiology is characterised by many symptoms: fatigue, spasticity, poor balance, motor weakness, heat sensitivity and mental depression. These, and other, reduce individual ability to perform activities of daily living and social interactions and may lead to physical inactivity associated with the development of secondary diseases. A multidisciplinary approach to MS is important to improve and maintain functional abilities, management of physical exercise has an important role in this process.

In a clinical setting we have been run a program of adapted physical activity (APA) for people with MS, based on a specific training protocol that stimulated aerobic fitness, strength and flexibility. Moreover, emotional aspects and motivating atmosphere have been cared. The purpose of our study (designed as pre-post case study) was to evaluate the effects of an APA program on functional capacity, quality of life perception (QOL), fatigue and independence.

Eight clinically definite MS patients, 4 men and 4 women (mean age 46.63 ± 8.18 years, mean disease duration 8.25 ± 5.18 years), with mild to moderate disability (EDSS 2.5-4.5) participated in a 20-sessions exercise program. The intervention consisted of an aerobic, strength and flexibility circuit training with individualized intensity, practised 3 times/week and by 2 patients simultaneously. The sample were evaluated, at baseline and at 8 weeks, by means of different instruments: SF-36 (Short Form-36 Health Survey) and WHODAS II (World Health Organization Disability Assessment Schedule II) to assess health and QOL; FIM (Functional Independence Measure) and BARTHEL (Modified Barthel Index) to assess patients' autonomy; FSS (Fatigue Severity Scale), FDS (Fatigue Descriptive Scale) and Modified Fatigue Impact Scale (MFIS) to evaluated fatigue perception. Moreover, functional tests were made to assess changes in maximal oxygen uptake (VO_{2max}), in endurance (6-Minute Waking Test), in walking speed (T25-Foot Walk) and in upper extremity function (9-Hole Peg Test).

Compared with baseline the MS patients demonstrated a significant improvement of QOL (WHODAS II +10.20%, $p < .01$, role physical +120% $p < .026$ and vitality +33.85% $p < .012$) and of fatigue sensation (FSS +12.85% $p < .034$, FDS +12.20% $p < .049$). Even though the short duration of the training, also functional capacity had registered increments.

Our findings lead us to support that a specific APA program could be an important functional element within a therapy program aimed at the treatment of MS.

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PLANNING OF SPORTS TRAINING FOR ATHLETES WITH DISABILITIES

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Key words: planning, scheduling, training, test.

Introduction

The performance of disabled athletes depends on the theoretical knowledge and practical abilities of the professionals working with them. The training planner schedules training times and methods enabling the athlete to achieve the best performance only after consulting the professionals below and customises athlete's programme in line with their periodic assessments (Gollin, Vota 2004). Sport doctor checks that athlete's physical condition enables him/her to perform the chosen activity. Physical therapist and orthopaedist evaluate any morphological and structural changes which might require biomechanical modifications to prostheses or ergonomic modifications to vehicles or training equipment. Personal trainer organises the exercises needed to improve general muscle and joint strength and recover the function of individual body regions. The trainer encourages and reinforces techniques and tactics aimed to the specific sport. The nutritionist manages nutrient intake in line with training and competition energy requirements. The psychologist manages the cognitive part, keeping high athlete's motivation.

Methodology

A sports season planning method is proposed, based on the development of a grid for the scheduling of training methods, which can be adapted in line with athlete's functional response to tests evaluating the development of his/her fitness (strength, resistance, speed), coordination and mental and physical health (Gollin 2006). Fixed on the grid are the training periods: basic, specific, competitive and transition: the weeks of each month (microcycles), grouped into larger units (mesocycles); the tests, training and selection trials; the trend of the quantity and intensity of the annual workload; and weeks of active recovery from training sessions.

Conclusions

Training without short, mid and long term assessments is risky and counterproductive. Training programmes for disabled athletes cannot neglect the organisation and management of the annual training schedule, which, if properly designed, focussed and subjected to regular assessments will help athletes to achieve their best sporting performance while respecting their physical, muscular and psychological wellbeing.

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THE POSSIBLE RELATIONSHIP BETWEEN THE TRADITIONAL CHINESE MEDICINE AND THE INTEGRATIVE MOTOR AND SPORT ACTIVITIES IN THE EDUCATIONAL CONTEST

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Key words: Traditional chinese medicine, motor and sport activities, disability educational contest.

The support teacher specialist in disability works to integrate the disabled person into society through every teaching activity which can contribute to the development of his/her autonomy and the strengthening of the vicarious skills. From this point of view, every didactic proposal, including the ones of motor and sport area, has an effect on the whole educational system. Therefore we think it is useful to reconsider some aspects of the teacher training process, such as the sense-emotional consciousness; the way in which the teacher could decipher the different behaviours of the subjects composing the class, getting crucial information for planning the didactic- educational action and choosing the most suitable strategies.

Here it is useful to underline that in Chinese traditional medicine the mind-shen is considered one of the life substances responsible for many activities concerning the training process such as thinking, consciousness, intuition, memory, invention, imagination. The techniques promoted by the Chinese traditional medicine, such as Tui-nà and An.Mò, Qi Gong gymnastics, transferred into an educational contest and adapted to the didactic and cultural boundaries of the school system, can go along with the supplementary activities and represent a new strategy in the learning process.

The proposal of a supplementary didactic workshop using some elements of the Chinese traditional medicine is also a tool for the expansion of the educational proposition for the disabled student with a sport and motor programme. In particular, Qi Gong is suitable in supporting the learning process because through its specific activities it fosters an energetic balance bringing harmony between the physiological and emotional functions while playing a physical activity.

The training of the support teacher is a good field for working towards the acquisition of a methodology in which elements of the Chinese traditional medicine can coexist with the sense-perceptive- motor listening techniques (Gamelli, 2001; Sotte-Pippa 2001) to facilitate the integration of the disabled student through specific physical activities , exalting the emotional value of the motor experience (D. Goleman, 1998). Such training would also represent an opportunity to strengthen the educational propositions for disabled students provided for by departmental programmes and to investigate new fields of the didactic research requested by the school.

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SIMILARITIES AND DIFFERENCES BETWEEN COACHING VOLLEYBALL AND SITTING VOLLEYBALL

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Key words: Sport for people with physical disability, Sitting volleyball, Special training methods for people with disability

Introduction

Sitting volleyball is a team game, which was developed from volleyball for people with physical disability. The aim and the basic idea of this two games are the same, there are only some differences on the rules: the net is lower and the field is smaller in sitting volleyball game, and players must have contact with the court with the part of the body from the shoulders to the buttocks at all times when playing the ball. To stand up, raise or take steps is forbidden. Other difference is, that the front-row players are allowed to block the service of the opponent. (This is forbidden in volleyball.) We wondered if these rule differences influence the tactic of the sitting volleyball games.

Research

The aim of our research was to analyze and to compare the man and women volleyball and sitting volleyball game elements. Based on game analyzing we would like to summarize the specific sitting volleyball technic and tactic elements, which differ to volleyball game.

Methodology of the research

We analysed international male and female volleyball and sitting volleyball games filmed by a video camera. We used the method observation according to the observation principle of volleyball games by Rigler (Rigler, 1981). We analyzed 4342 ball touches of man and women sitting volleyball games. All ball touches (servings, blocks, receiving the serving, setting, attacks, defence) were registered and analyzed. The place of the executing, the techniques of every hits and the efficiency were registered and analyzed.

Results

As a result we have founded, that there are significant differences between two games, volleyball and sitting volleyball. Block is more often used in sitting volleyball, it is the most effective defending game element. In sitting volleyball overhand passes are more often used and are more effective like other technics. Because of the smaller field and lower net, sitting volleyball is a faster game than volleyball, so “saving” touches are more often used, and must be also practised on training. In our presentation we would like to show all the differences -considered to game elements- between the games and also assume the specific exercises, which must be practised on sitting volleyball training.

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PEER TUTORING FOR STUDENTS WITH SEVERE DISABILITIES IN INCLUSIVE PHYSICAL EDUCATION

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Key words: students with disabilities, peer tutors, inclusion, physical education.

Researchers often cite the inclusion of students with severe and multiple disabilities (SMD) as being the most challenging, especially when one of the goals of inclusion is frequent, meaningful and spontaneous interactions between students with SMD and their peers (Place & Hodge, 2001; Slininger, Sherrill, & Jankowski, 2000). While applied peer tutoring strategies have been successful in enhancing the academic outcomes of students with disabilities with respect to motor engagement in GPE (Lieberman, Newcomer, McCubbin, & Dalrymple, 1997), empirical investigations on continuous multi-component behavioral interactions between students with and without disabilities has been limited. Given the extent and relevance of the reported information, there is need for research that examines specific behavioral interactions demonstrated by students with and without SMD in natural GPE environments.

This study investigated the effect of trained peer tutors on physical, instructional and social interaction behaviors between students with SMD and their peers without disabilities in inclusive elementary physical education. Additional measures addressed the activity time data of students with disabilities. The study was conducted under three instructional support conditions for students with SMD: (a) teacher-directed, (b) peer-mediated, and (c) voluntary peer support. Nine students without disabilities served as age appropriate peer tutors for three students with SMD. All peer tutors attended three, 30-minute training sessions across three consecutive days. A single subject delayed multiple baseline research design across participants was used. All observation sessions were collected on videotapes. The effect of peer tutoring on multi-component behavioral interactions was determined by the Computerized Evaluation Protocol of Interactions in Physical Education (CEPI-PE), a data collection program for multiple interaction behavior measures in inclusive physical education settings.

During teacher-directed conditions students with SMD indicated high level of interactions with adults. The presence of peer tutors during peer-mediated conditions had positive effects on increase of instructional and physical interaction behaviors between students with and without disabilities, while social interactions remained low. Also, interactions of students with SMD with peer tutors and with other peers were high during voluntary peer support conditions. The activity engagement time data increased for all students with SMD throughout intervention sessions. Interactions between students with SMD and teachers decreased towards the end of intervention. In this research, using age appropriate peer tutors were effective at assisting students with SMD in inclusive general physical education.

GAIT ABNORMALITIES IN PATIENTS SUFFERING FROM TYPE 2 DIABETES

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Key words: type 2 diabetes, gait analysis, fall prevention.

Introduction

It is well known that people with diabetes commonly develop damage to nerve tissue [1]. On average, symptoms become evident 10 to 20 years after diabetes has been diagnosed. Approximately 50% of people with diabetes will eventually develop nerve damage. Peripheral neuropathy develops in stages: at the beginning, intermittent pain and tingling is noted in the extremities. Later on, pain is more intense and constant. Finally, a painless neuropathy develops. One of the consequences of neuropathy is the decreased proprioception, which may lead to abnormal gait patterns [1,2]. This work presents a study carried out on type 2 diabetes patients to ascertain if they are affected by gait abnormalities more frequently than normal subjects. Moreover, we verified that participating a “Adapted physical activity promotion project for subjects suffering from Type 2 diabetes mellitus” may improve their locomotion capabilities and decrease their fall propensity.

Materials and methods

A pilot study carried out on a population of 9 patients demonstrated that they show a higher frequency of gait abnormalities with respect to a population of normal subjects of similar age. To validate these preliminary results, a group of more than 40 patients suffering from type 2 diabetes (pilot project to promote physical activity in Type 2 Diabetes Mellitus, a partnership ASL 1 To – SUISM – Circoscrizione 10 of Torino) underwent a first gait analysis evaluation before undergoing a cycle of adapted physical activity. At the end of the cycle they underwent a second evaluation session.

Each session consisted of recording foot-switch signals and knee joint angles in the sagittal plane, while the subject was walking back and forth over a length of 9 m for approximately 150s. The gait cycle types used by subjects were then obtained by using a user independent algorithm, and, for each relevant type, statistical gait analysis was applied to goniometric as well as to foot switch signals. Results were then evaluated to obtain a fall-propensity score for each subject.

Results and discussion

Although this study is still in progress, some preliminary results found during the pilot study seem to be confirmed. First, diabetic patients are more inclined to fall than subjects belonging to the control group. The most frequent gait abnormalities that we found are a) frequent forefoot contact, b) prolonged push-off phase, c) fast knee flexion in the weight acceptance phase, and e) stiff leg at the initial contact. During the congress we will present data relative to the entire study.

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THE EFFECT OF A SWIMMING PROGRAM ON GROSS MOTOR FUNCTION OF CHILDREN WITH CEREBRAL PALSY

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Key words: Cerebral palsy, gross motor function, swimming program.

Introduction

The purpose of the study was to examine the effects of a 10-week swimming program on the gross motor function, range of motion and spasticity of 6 students (4 boys and 2 girls) with cerebral palsy (CP). Additionally, 6 students (3 boys and 3 girls) with CP, approximately of the same age, constituted the control group. The students were able to walk independently with or without a gait aid and were able to follow simple instructions.

Method

The program was held twice a week and consisted of: a) flexibility exercises and b) basic crawl and backstroke swimming, with training intensity of 60 -80% of the maximal heart rate. Measuring instruments were the Gross Motor Function Measure (GMFM) (Russell et al., 2002; Thorpe & Reilly, 2000), a plastic goniometer and the modified Ashworth Scale (Bohannon & Smith, 1987). Independent variables were the experimental condition (experimental and control groups) and time (first and final measurement). Dependent variables were: a) the standing and walking GMFM scores, b) the active and passive range of motion (hip, knee), and c) spasticity.

Results

The 2 X 2 multivariate ANOVA revealed no interaction between experimental condition and time, with respect to the gross motor function ($F = 3,16$, $p = ,089$). Further, the post hoc univariate analysis was not significant as well. Examination of the mean scores revealed that the experimental group increased the mean walking scores to a wider extend ($M1 = 59,02$ $M2 = 65,04$) compared to the control group ($M1 = 59,02$ $M2 = 59,95$). Similarly, no interaction was found with respect to the active range of motion of the hip ($p = ,076$, $F = 3,92$) and the knee ($p = ,090$, $F = 3,52$). Significant interaction was found with respect to the passive range of motion of the hip ($p = ,001$, $F = 20,97$), knee ($p = ,045$, $F = 5,28$), and spasticity of the adductors ($p = ,002$, $F = 16,35$) and knee flexors ($p = ,049$, $F = 5,33$).

Discussion

The present findings suggest that a swimming program may have a positive effect in gross motor function, range of motion and spasticity, in students with spastic cerebral palsy. Future researchers may evaluate the effectiveness of swimming programs with longer duration, a wider sample size, the retention of the effects in a follow up assessment, etc.

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VALIDITY AND RELIABILITY OF THE QUALITY OF LIFE INDEX AND THE UCLA LONELINESS SCALE IN GREEK ELDERLY

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Key words: Quality of Life (QoL), Loneliness, Elderly.

Introduction

The present study was designed to provide validity and reliability evidence of the Quality of Life (QoL) Index (Ferrans & Powers, 1998; 1984) and the UCLA Loneliness Scale (Russell, 1996) in a sample of Greek elderly.

Method

Following translation validity evidence, 79 elderly were examined in the senior citizen's clubs in Athens, Greece. Construct validity was tested through the following comparisons: a) gender: males vs females, and b) age: 60-74 years old vs 75 and above years old. Statistical analyses were based on multivariate (MANOVA) and univariate (ANOVA and t-tests) comparisons in order to support the hypotheses tested.

Results- Discussion

The results revealed that males had significantly higher quality of life and significantly lower loneliness than females. Moreover, males and females had significant differences at three factors of the QoL Index (health/ functioning, socio/ economic factor, psycho/ spiritual factor). No gender differences were found for the family factor. Further, the 60-74 years elderly had significantly higher quality of life than the 75 years old and above group. The 60-74 years group had also significantly higher scores at three factors of the QoL Index, except the psycho/ spiritual. Finally, no significant differences, according to age, were found for loneliness. For concurrent validity, there was a significant intercorrelation between quality of life and loneliness ($r = -.494, p \leq .05$). The internal consistency was tested with Cronbach alpha, with scores ranging from .656 to .825 for the four factors, and .890 for the QoL Index, while for loneliness the Cronbach alpha was .812. Further, the test-retest coefficients were .793 for the QoL Index, .805 to .916 for the four factors and .985 for loneliness. Overall, the measures obtained with the QoL Index and UCLA Loneliness Scale were sufficiently valid and reliable and may be used with confidence with senior citizens in Greece.

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THE NATURE OF SERVICE DELIVERY IN ADAPTED PHYSICAL EDUCATION AND SUPPORT FOR INCLUSION

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Key words: Inclusion, Adapted physical education, Service delivery, APE consultants.

International studies (Kudláček, Válková, Sherrill, Myers & French, 2002; Lienert, Sherrill & Myers, 2001; Meegan & MacPhail, 2006) tell us that with a growing number of students with disabilities being included in general education, more and more physical education teachers are faced with the reality of teaching these students together with the rest of the children. In most cases teachers are not permitted to decide if they will have a student with a disability in their class, but they can decide to which extent they will include this student (Lienert et al., 2001). However support services are available only in some countries, states and school districts. From few published studies we know very little about the nature of work of adapted physical educators, their experiences and concerns related to providing support to inclusion. The study of Lytle and Hutchinson (2004), which focused on the nature of work of APE consultants in California, served as guidelines for present study. All studies published on the nature of work are from USA. Still we believe that in there is a difference in the nature of service delivery, quality and level of APE in different states. Therefore it is important to analyze adapted physical education services in a school district. The purpose of this study is to describe the nature of work of public school adapted physical educators in selected school districts in California, and Texas. The greatest significance of this study is creation of information base to guide improvement of service delivery and professional preparation. Participants included 6 females and 2 males with experience teaching (range of 2-23 years) in the field of adapted physical education. Data collection included individual in-depths interviews, demographic data sheets and interview notes. Results showed the differences in the nature of work among APE specialists. Participants had high teaching loads (44-90 students) and served wide range of schools (1-20), which creates quite different teaching profiles. Most teachers were involved in APE consulting. Results also indicated the needs to incorporate issues of consulting into teacher preparation and change the university studies more relevant to “real life teaching”.

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ADVANCING PARALYMPIC SPORT THROUGH SCIENCE: INTERNATIONAL COLLABORATION

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Keywords: athlete classification, boosting, disability sport, elite sport, performance enhancement, skills testing, wheelchair rugby.

In January 2007, the International Network for the Advancement of Paralympic Sport through Science (INAPSS) steering committee was established. INAPSS is an initiative of the International Paralympic Committee Sports Science Committee (IPC SSC) and the steering committee comprises people from most IPC World zones.

INAPSS is a structure through which IPC SSC can ensure that important Paralympic sport science questions are addressed by experienced researchers who will provide quality answers. The geographically diverse membership of INAPSS guarantees an international and multicultural perspective and permits recruitment of comparatively large samples. In this way, IPC SSC and INAPSS are complementary in their tasks. A number of projects have been initiated and are described below.

Boosting in Paralympic Sport: “Boosting” refers to deliberate inducement of autonomic dysreflexia by athletes with high spinal cord injuries in order to enhance athletic performance. Boosting is extremely dangerous and IPC SSC has secured funding through the World Anti-Doping Agency to investigate the prevalence and attitude of athletes to its use. Data will be questionnaire-based and INAPSS partners have contributed to the design, distribution and analysis and results will inform a position statement on the practice of boosting in Paralympic Sport.

Evidence-based Classification in Paralympic Athletics: IPC Athletics has endorsed a project that will develop evidence-based methods for classifying athletes based on the extent of activity limitation resulting from impairment or, in other words, athletes are classified according to how much impairment impacts athletic performance (Tweedy, 2002). A large, multi-continental sample of athletes with disabilities is required and INAPSS partners will make a vital contribution to this effort.

Wheelchair Rugby: Identification of player motion characteristics during competitive wheelchair rugby games can be used to enhance coaching and training practices. Time-motion data has been collected by INAPSS partners during an international tournament in USA, and additional data will be collected during the Beijing Paralympic Games. INAPSS partners are also working to standardize fitness and skills testing protocols for wheelchair rugby players.

These projects indicate that, thus far, the INAPSS initiative has been successful although the true value of the network must be evaluated over a longer time period. INAPSS will continue to work toward the primary goals of optimizing sport performance in athletes with disabilities and addressing a variety of sport science issues to help drive the Paralympic Movement forward.

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QUALITY OF LIFE COMPARISON BETWEEN ADULTS WITH CEREBRAL PALSY AND THE GENERAL POPULATION

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Key Words: CP, exercise, gross motor function, health survey, mental health, mobility, motor impairment, pain, physical disability, physical function, QOL, SF-12, well-being.

Introduction

Adults with cerebral palsy (CP) have activity and participation restrictions as a result of their physical and functional limitations. This paper examines QOL data on adults with CP enrolled in an exercise intervention study and compares it to QOL data for the General U.S. population (Ware et al., 2002).

Methods

Adults with CP who were able to follow directions, understand assessment questions and reported having pain were recruited to participate in an exercise intervention for pain management. Participants included 25 adults (16 females, 9 males) with a mean age of 42.4 years (± 11.5). Based on the Gross Motor Function Classification System (GMFCS), the breakdown of participants' mobility status was as follows: Level I (n = 5), Level II (n = 1), Level III (n = 4) Level IV (n = 12), and Level V (n = 3). As part of the assessments, participants completed the SF12v2. Norm-based subscale (Physical Functioning (PF), Role Limitations due to Physical Health (RP), Bodily pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role Limitations due to Emotional Health (RE), Mental Health (MH)) and summary scores (Physical (PCS), Mental (MCS)) were computed and compared to the General U.S. population norms and to a subset that reported limitations in use of arm(s)/leg(s).

Results

Comparisons indicate that adults with CP had lower PF and MH scores than either comparison group, however VT and SF scores were higher than the Arm/Leg Limitations group (Table 1). All other subscale scores were the same for the CP group and the Arm/Leg Limitation group. The CP group had a slightly lower PCS and higher MCS. A limitation of the study was the small size of the CP sample.

Table 1. Norm-based SF12v2 subscale and summary scores by group

	PF	RP	BP	GH	VT	SF	RE	MH	PCS	MCS
General Population	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	49.63	49.37
Cerebral Palsy	34.13	40.04	39.91	42.07	48.96	47.28	43.11	43.08	37.43	48.65
Arm/Leg	40.11	39.97	40.86	43.21	44.68	43.42	43.91	46.32	39.52	46.80

Conclusion

Given the large number of motorically impaired adults with CP in this sample, it is not surprising that PF and PCS were lower than both comparison groups. The higher VT, SF and MCS scores are interesting when considering the extensive motor impairment of the CP group, however, the majority of participants were engaged in community programs, which may have influenced these scores.

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INCREASE OF THE ENDURANCE CAPACITY BY HAND BIKE ON A PARAPLEGIC MALE ATHLETE: A CASE STUDY

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Key words: SCI, hand bike, paraplegic, VO₂max, training, endurance capacity, disabled people, APA.

Introduction

Several authors have emphasized the importance of physical exercise and sport in people with Spinal Cord Injuries (SCI) in order to maintain or improve adequate physical fitness levels. Some others also claim that higher fitness levels improve daily functioning and health status and, for SCI, physical training is an important part of the rehabilitation process, focused on reaching an optimal level of functional ability and independence. Among aerobic physical capacity measures, peak oxygen uptake and V'O₂max are closely related to the level of function of biological systems.

The aim of this case study is to give concrete indications about the possibility to improve the aerobic capacity, by using a hand bike with a active paraplegic athlete.

Methods

One paraplegic male athlete (age 32 yrs, BMI 24.53) volunteered to participate in the study and underwent the following tests performed on his own race hand bike twice with an interval of 121 days: 1) an incremental test till exhaustion, allowed the maximal mechanical power (Wmax) and the maximal aerobic power (V'O₂max) measurement on a breath by breath basis (Sensor medics, Italy); 2) an incremental intermittent test with blood lactate measured (Lactate Pro LT-1710) at the end of each of the 6 minutes step was used to draw the lactate/power curve and to calculate the mechanical power that elicits the blood lactate concentration at 2 and 4 mM (W2 and W4). The disability of the athlete was a complete traumatic spinal cord injury at the level of the 10th thoracic vertebra (Th10). All measurements were performed in the Human Performance Lab (Centro Mapei, Castellanza, Italy). During the four months of training the athlete completed: 1442 km at intensity between 70-78% of maximal heart rate (HRmax), 1420 km between 82-87% of HRmax, 180 km between 92-93% of HRmax and 427 km above 95% of HRmax.

Results and conclusions

An increase of all physiological parameters occurred: V'O₂max, 2.59vs3.25 l/min, Wmax 196vs211 Watts, W2 101vs150 Watts and W4 125vs179 Watts.

The hand bike ergo meter seems to be interesting for SCI because it mimics the daily motor tasks of wheelchair users and allows for adjustment of the wheelchair. Furthermore, on the basis of the results of this study, it could be recommended to train at above 70% of the maximum heart rate, to provide an enhancement of endurance capacity for people with SCI.

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PRELIMINARY STUDY ON ADAPTED PHYSICAL ACTIVITY (APA) FOR PATIENTS SUBJECT TO HEMODIALYSIS: CONTRIBUTION TO CLINICAL IMPROVEMENT AND PERCEIVED LIFE QUALITY

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Key words: adapted physical activity, hemodialysis, chronic renal failure, anaemia.

Introduction

This study, still in progress, originated in the out-hospital HD facility of Settimo Torinese, affiliated to the ASL TO4 of Chivasso (Turin) where 34 out-patients with End Stage Renal Disease (ESRD) are treated by regular Dialysis treatment (RDT). The RDT is a physical therapy which substitutes the renal functionality, applied to persons affected by ESRD, this condition representing the last phase of many renal diseases. Among the pathologies with a chronic trend, the RDT is one of the most expensive medical treatments used in developed countries, the ESRD representing in Italy the second pathology for expenditure after diabetes mellitus. Nevertheless, patients subject to RDT may still retain symptoms of physical weakness leading, as a consequence, to a sometimes marked reduction of social life.

As ESRD progresses, before RDT, circulatory diseases, anaemia, bone decalcification, peripheral neuropathy and loss of muscle mass may occur. As a result, the patient decreases his motor activity with a worsening of his cardio-circulatory, muscular and skeletal conditions. Related to RDT, patients may show: uneasiness and post dialysis asthenia, easy fatigue, cramps, state of depression.

Purpose

Along a scheduled period of two years the aim of this study is to evaluate if APA could have a positive influence by improving the quality of life of patients subject to dialysis, reducing their functional restrictions, the joint and muscular pains, the weight of possible cardiovascular complications, the reduction of stress and depression.

Method

The sample of our study is a group of 10 persons subject to dialysis, aged between 51 and 80 years, inserted for a two years period in a APA dedicated program. The activity takes place three times a week, in the out-patients RDT facility environment, before starting the dialysis therapy. The duration of the activity session is about 30 minutes, and, as months go by it may be increased.

Every six months the effectiveness of our intervention is evaluated by examining the variations, by paired statistics, of the level of: haemoglobin, vitamin B12, ferritin, serum iron, folate, transferrin, beta2-microglobulin. Weekly dosage of erythropoietin and eventual blood transfusions are recorded.

Then, tests have been carried out on some physical performances: articularity, resistance, flexibility

Results

During each session a global work on different corporeal areas has been carried out. Moreover the attention was focused on equilibrium, proprioception, respiration and perception of one's own body: these are essential elements in order to have a good quality life and to prevent the risk of relapses. Moreover this activity is favouring sweating in order to make that the greater loss of liquid allows a greater amount of drinking without affecting the need of ultrafiltration.

Moreover the patients showed a positive attitude to take part of this APA activity, enhanced by the perception, among most of them, of a progress in their motility in the first six months interval of the study, while no variations were still found in the blood parameters taken under control.

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A QUANTITATIVE METHOD FOR THE ASSESSMENT OF MOTOR CAPACITY IN ELDERLY SUBJECTS

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Key words: level walking, accelerations, motor ability, elderly.

Introduction

The evaluation of the effectiveness of physical activity is usually performed at skills level using tests that provide semi-quantitative measures based on predefined scales. These tests are quick, inexpensive, and well-accepted by the subjects, but often lack of sensitivity and supply insufficient information about the causes of unsatisfactory performance. Instrumented movement analysis may allow overcoming these limitations. However, for field applications, experimental set-ups and protocols “economical” for the experimenter and minimally perceivable to the subject must be devised. This study proposes a method for the assessment of walking ability which can be implemented in the field using wearable sensors.

In able-bodied individuals the oscillations of head, trunk and pelvis during level walking are characterised by quasi sinusoidal trajectories and by an attenuation of the acceleration going from pelvis up to head level, allowing for a better control of equilibrium [1]. This ability to control head accelerations is expected to be compromised in elderly subjects, and its measure could be a suitable parameter for their motor capacity assessment [2].

Methods

A stereophotogrammetric system was used to reconstruct the displacement of markers located at head, shoulder, and pelvis level while 16 young (24 ± 4 y.o.) and 20 older (72 ± 4 y.o.) women walked along a linear pathway. The root mean square of the accelerations in the medio-lateral (ML), antero-posterior (AP), and Vertical (V) directions were calculated and were used to define three coefficients that quantified the attenuations of the accelerations going from pelvis to head, from pelvis to shoulder and from shoulder to head.

Results and discussion

The attenuation coefficients were independent from walking speed, and hence suitable for group and subject comparison.

Both groups attenuated the AP accelerations both from pelvis to shoulder and from shoulder to head. However, the reduction of the shoulder to head acceleration was less effective in older women, suggesting that, in this population, the ability to exploit the cervical hinge to attenuate the AP acceleration is challenged. Young women managed to exploit a pelvis to shoulder attenuation strategy also in the ML direction, whereas in the elderly group the head acceleration was even larger than the pelvis acceleration.

Conclusion

The loss of ability in controlling the head acceleration can be one of the causes for the reduced walking ability in elderly women and therefore a parameter sensitive to motor capacity variations. The accelerations of the trunk and head may be measured using wearable devices therefore making the method applicable in field situations.

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MANTAINING FUNCTION OF CHRONIC STROKE SURVIVORS

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Key words: adapted physical activity, community-based program, rehabilitation.

Introduction

In chronic stroke survivors impairments lead to a sedentary life style. This in turn, causes new impairments (e.g., muscle atrophy, cardiorespiratory deconditioning, altered joint range of motion), functional limitations and disability which further decrease activity levels. This vicious circle is worsened by non-disease conditions such as depression, lack of volitional pursuits, architectural barriers and lack of family and social support. There is published evidence derived from studies in hospital or rehabilitation settings that this vicious circle can be reversed by adapted physical activity (APA) programs [1]. However, very little evidence is available about whether these APA experiences can be safely and effectively translated in a community setting.

Methods

We investigated the safety and effectiveness of a 12-month community-based APA program for chronic stroke survivors in 71 participants. The APA program was aimed at improving muscle force, joint flexibility and cardio-respiratory function.

The 6-minutes walking test (6MWT), the short physical performance battery (SPPB), and the Berg Balance Scale (BBS) were used to assess gait and balance functions at T0, and after 6 (T6) and 12 months (T12). Basic activities of daily living profiles, depression, and quality of life were assessed using the Barthel Index (BI), the Hamilton Depression Scale (HDS), and the Stroke Impact Scale (SIS), respectively.

Results and Discussion

The proposed program was safe and improved gait and balance functions. Travelled distance and velocity recorded during the 6MWT increased at T6 and remained stable at T12; SPPB values increased at T6 and T12, with the latter increase due to an improved rising from a chair ability; BBS increased at T12.

As a result, enhanced basic activities of daily living profiles were found: BI values increased at T6 and then remain stable at T12. Depression and quality of life improved as well: HDS was reduced at T6 and even more at T12 and the physical, communication, ADL and dexterity components of the SIS were significantly improved.

Many of the adopted indicators already reached the highest/lowest value at T6, suggesting that instrumented tests should be added in longer term assessments.

Conclusion

These APA experiences can be safely and effectively translated in a community setting. Larger studies are needed to determine whether community-based APA programs improve rehabilitation and health outcomes in the chronic stroke population.

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TOWARDS EVIDENCE-BASED CLASSIFICATION IN PARALYMPIC ATHLETICS - WHAT IS THE OPTIMAL SEATED THROWING POSITION?

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Key words: disability athletics, classification system, biomechanics.

In 2008 the classification system used in Paralympic Athletics was significantly revised (International Paralympic Committee 2007). The new classification system aims “to minimize the impact of impairment on the outcome of athletic competition” (Tweedy and Bourke, 2007, p.8) and this will be achieved if athletes are placed into classes according to the extent of activity limitation caused by impairment or, more simply, according to how much their impairment impacts on athletic performance. The following study is one of a suite that have been planned to develop evidence-based methods for quantifying the extent of activity limitation resulting from impairment in Paralympic Athletics.

Paralympic Athletics comprises a range of activities, one of which is, seated throwing the focus of this study. To develop evidence-based methods for estimating how much various impairments (e.g., impaired muscle power, impaired range of movement) will impact on seated throwing, knowledge of the optimal seated throwing technique is required. It is well established that the parameters that determine throwing performance are the speed, angle and height of implement release (Zatsiorsky, Lanka, & Shalmanov, 1981) however only a small number of studies have described the kinematics required for optimising these parameters in the seated position. Unfortunately, these studies are of limited value for the purposes of determining optimal seated throwing technique because the participants have various types and severity of impairment and therefore use positioning and technique that will minimise the impact of their impairment on performance. In order to definitively describe optimal seated throwing position and technique, the technique used by people with intact body systems and structures should be studied and described.

The rules of Paralympic Athletics permit seated throwers to use two main types of technique – one where the non-throwing hand is free and performs a similar function to the conventional throw technique and the other where the athlete holds onto a rigid pole with the non-throwing hand, using it to assist with stability and propulsion. The series of experiments described in this paper answer the following research questions:

- what is the optimal seated throwing position when the non-throwing hand is free?
- what is the optimal seated throwing position if the athlete can hold onto a rigid pole with the non-throwing hand?
- What is the most advantageous technique – with or without a pole?

Answering these questions will contribute to the development of an evidence-based classification system.

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PHYSICAL ACTIVITY PROMOTION PROJECT FOR NIDDM AFFECTED PERSONS

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Key words: active lifestyle, group physical education, diabetes type 2, complications, glucose intolerance, cardio-freq. adaptation, BMI, glycosylated haemoglobin.

Introduction

Many scientific studies demonstrated effectiveness of an active lifestyle on the increasing of well-being and prevention among many chronic diseases (such as: hypertension, hyperlipidemia and glucose intolerance). It has been developed a Project of Promotion of Physical Activity in collaboration with SUISM Torino, Circonscrizione 10 Torino and S.C. Diabetologia e M. Metaboliche O. Oftalmico (ASL TO1).

Objective

To increase daily physical activity with Adapted Physical Activity in group class course. It has been taken part by a champion of 36 persons affected by Non-Insulin-Dependent Diabetes Mellitus.

Motor qualities and variations of NIDDM complication predictive factors have been periodically evaluated and clinical parameters taken during ambulatory visits have been registered.

Method

The champion has been selected from the same category of age, residence, BMI and clinic diagnosis date of NIDDM. The course of APA has been conducted by two doctors in Sport Sciences, one of them specialized in APA (76/s) as tutor.

Tests evaluation have been done every three months for a period of 12 months, during which the champion took part to the course classes, of 1 hour, 2 times a week. Observed motor qualities: *flexibility* with “sit and reach test” and divarication measurement of lower limbs; *strength* of the lower limbs with isometric test of “wall sitting” and dynamic test of *bending repetition*; heart rate and blood pressure adapt and restore response to a low intensity aerobic exercise (6 minutes walking).

At the beginning and at the end of the course, ambulatory data (in repose conditions) of weight, height, BMI, heart rate, blood pressure and glycosylated hemoglobin have been recorded.

Results

It has been recorded gradual increasing of performance among all motor tests, above all in the aerobic test of walking with lower compensation of blood pressure and heart rate and shorter periods of restore.

There has been correlation between “Sit and reach test” and glycosylated hemoglobin values. No significant improvement have been observed among BMI and weight distributions.

Conclusions

We consider that practicing in group courses of non-sportive physical activity, but oriented to development of personal abilities, contrast many degenerative effects of the NIDDM, furthermore improve movement levels in lifestyle of the champion.

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AN EVALUATION OF GAME EFFICIENCY OF FEMALE SITTING VOLLEYBALL PLAYERS

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Key words: sitting volleyball, game efficiency, classification.

Sitting volleyball is a paralympic team sport for persons with locomotor disabilities. Athletes must have a minimum disability to be eligible to compete. The purpose of this study was to examine the game efficiency of elite female sitting volleyball players with regard to their type of impairment and arm reach. Forty nine female athletes representing 7 national teams competing at the 2006 World Sitting Volleyball Championships took part in this study. All tournament games were recorded on a videotape by two experts. The Game Efficiency Sheet for Sitting Volleyball was developed to evaluate 17 parameters of sitting volleyball efficiency such as types of attack, block, receiving the ball, service and defence. The post-game analysis was done by two sitting volleyball experts. All athletes were grouped according to the type of impairment and arm reach in the seated position. Comparison of the game efficiency parameters in relative values (calculated per total number of point actions in the game) did not show statistically significant differences among players with various types of impairments. The Kruskal-Wallis Test indicated significant differences in the block with scored point, block with ball in the play, attack with scored point and ball receive with lost point among athletes grouped with regard to the arm reach. In conclusion, players with higher arm reach presented significantly better game efficiency. Authors suggested correctness of WOVD classification system for sitting volleyball players.

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RELATIONSHIP BETWEEN ANAEROBIC POWER AND SELECTED TESTS FROM THE BECK BATTERY OF QUAD RUGBY

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Key words: wheelchair rugby, quadriplegia, anaerobic power, skill tests.

Wheelchair rugby (WR) is a team game for persons with disabilities. It contains elements of wheelchair basketball, ice hockey and American football. It is a contact game composed of many sport-specific skills such as picking, blocking, passing or wheelchair maneuverability which depend on strength, speed, endurance, coordination, and flexibility.

In Poland as well as all over the world the majority of WR players are individuals with quadriplegia – persons with four limbs paralysis or paresis. WR combines short intense bouts of exercise depend on anaerobic fitness. No scientific evidence has been found regarding the relationships between anaerobic parameters and field tests in wheelchair rugby players with quadriplegia. The purpose of this study was to examine relationship between arm anaerobic power and selected tests from the Beck Battery of Quad Rugby Skill Tests in 33 polish wheelchair rugby players. To determine the values of peak power (PP) and (MP) with respect to body mass, the Wingate Anaerobic Test (WAnT) procedure was used with an arm crank ergometer. Three tests (test 1 - maneuverability with the ball, test 3 - picking and test 4 - sprinting) of Beck Battery were selected with respect to the duration (6 – 100 s) and work specific for short -, intermediate and long-term anaerobic performance.

All tests were executed with use of personal rugby wheelchairs in sport hall with wooden floor. The Pearson correlation coefficient showed significant relationships between PP and test 1 ($r = .70, p = .000$), test 3 ($r = -.60, p = .001$) and test 4 ($r = -.74, p = .000$). Significant correlations were also observed between MP and test 1 ($r = .74, p = .000$), test 3 ($r = -.76, p = .000$) and test 4 ($r = -.84, p = .000$). Significant correlations between WAnT parameters (PP and MP) and chosen Beck Battery tests (first, third and fourth) may suggest possibility to use them as a control tools for anaerobic performance during the training process of wheelchair rugby players.

This work was supported by grant No DS-89 from the Polish Ministry of Education and Science.

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EVALUATION OF SWIM ACTIVITY EFFECTS IN AN AUTISTIC HYPERACTIVE CHILD

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Key words: Autism, hyperactivity, swim activity, valuation.

Objective

To evaluate the effects of a swimming training programme in an autistic-hyperactive child.

Patient and methods

A six year old autistic-hyperactive child, not verbal (he utters only few words in specific situations), he is not able to concentrate on the same activity for more than ten minutes. He expresses his anger through shouts and messy movements, able to observe and imitate, but he doesn't accept to obey verbal commands. He isn't able to communicate with the environment. The child underwent an Adapted Physical Activity (APA) program in a swimming pool. Assessment was made at the beginning and at the end of the educational project and it is based on three points: level of competence according to Sherrill's model, "Water Orientation and Swimming Skill Inventory" test, assessment of changed behaviour observed by his family and the operator at the beginning and end of the APA program. The APA program consisted in a weekly meeting of an hour, for 16 weeks.

Results

It has been noticed, according to Sherrill's first competence level "movement exploration" an acquisition of the point 5 and the point 9; in the second competence level "advanced exploration" an acquisition of points 1, 2, 3, 4, 5, 10; and in the level "swimming for beginners" the acquisition of the points 2, 7, 9, 10, 11. No variation verified in the others points. In the "water orientation and swimming skill inventory" test the child changed from a score of 48 to a score of 63. Both the family and the operator noticed that the child's behaviour changed. In the swimming hyperactivity, shouts and angers disappeared. The child is now able to concentrate on his activity for an hour, to coordinate his movements in the water and to recognise the different parts of the body following the instructor's. He has improved in the emotional level, keeping in touch with the instructor both on a gestural and on a verbal level. Moreover, when the child is at home, after this activity, he is still quiet and he is improved in the space-temporal level as he can recognise the day of the swimming activity in the calendar.

Conclusion

Through the activity in the swimming pool it has been possible to reduce the hyperactive behaviours, to teach the swimming basic elements and to improve the emotional and space-temporal aspects typical of the autism.

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DISABLED CHILDREN AND SCHOOL INSTITUTION: INTEGRATION OR NOT INTEGRATION?

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Key words: school integration, society, disabled children, normal endowed children, model, imitation.

The presence of a law that enacts the integration in some countries or the lack of it in others, determines a different mentality, as the exploitation or not exploitation of the disabled person determines the orientation of the legislation.

The most important goal for a child is normality, that allows him to express his own abilities to the best and to have relations in an effective and autonomous way with the environment. The first channel of learning is the *imitation*, that asks for a "model" to which the child must aspire to build his own personality: at school the best model is constituted by peers. A disabled child that attends integrated school every day relates with normal gifted classmates; on the contrary, a child in a special school finds himself among children having the same problems like him.

Search:

* Paris, medical - educational institutes only attended by disabled children:

- Normal gifted children don't relate with disabled children
- Disabled children reveal big difficulties in social adjustment and scarce ability to react to relation difficulties.

* Italy, primary school, with disabled children integrated in the class groups:

- Normal endowed children interact with disabled companions and sustain them, building relationships of cooperation and mutual respect.
- Disabled children start processes of imitation showing motivation and need to join the group. If stimulated in the correct way, they are autonomous to find useful adaptations.

Conclusion

Disabled children are fundamental for the growth and the reading of the world for the other children, and so on the contrary.

Integration derives from adults: they must create favourable conditions for the peer education.

Obviously, every solution of integration should be analyzed with reference to every single case and the seriousness of the disability. It is also important the planning of individualized specialistic interventions with structures of support and diversified times of integration.

Which effect can you have without scholastic integration on society? You cannot educate to the respect of difference as a source of enrichment, to "normality" as a concept rich in different facets, to the unconditional respect of the person, to the cooperation and the responsibility.

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HIPPOTHERAPY USE AS A REHABILITATION TOOL FOR USERS WITH SCI AT BEITOSTOLEN HEALTH SPORTS CENTRE

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Key Words: Spinal cord injuries, Hippotherapy, and Exercise.

Beitostolen health sports centre (BHSS) is recognized as an official part of the national specialist health service system providing rehabilitation services in Norway . The users are admitted to the centre by application from a medical doctor, a rehabilitation team, special pedagogues or any other educational or rehabilitation professional. The users are usually involved in health sports activities designed to improve physical abilities and foster higher levels of mental, physical, and spiritual well being. The objective of the study was to explore and evaluate the effects of the hippotherapy program on users with spinal cord injuries (SCI) at BHSS with a keen interest in the aims and objectives for the users. The research questions addressed issues such as, the specific aim of the program for each user, reasons for only 3 users for hippotherapy, whether the different lesion levels determined the individuals program, the specific horse movement gaits applied or used, the outcome of the program whether beneficial or not, indications and contraindications for the users. The study was based on a case study approach with purposeful sampling, the data was derived from interviews, and observations which were later corroborated with the existing literature about SCI users and hippotherapy effects. Linkert scale of 5 was used to find out the effectiveness of the centre to the users objectives. There were a total of 13 users with different levels of SCI lesions but only 3 did therapeutic horse riding. The horseback riding program was done at least twice per week either indoors or outdoors. Each session lasted 30 minutes. The users were instructed on how to control the horse initially using the mien then later using their body limbs. By the end of the 3rd week the users were able to use their lower limb muscles to stop, start, change direction or speed of the horse which indicated a marked improvement either in their muscle trophic, tone or strength. All of them rated the program as extremely good on a linkert scale of 5. They also confirmed that they had achieved some of their objectives and goals e.g. pain relieve, improved endurance capacity, strong muscles and being able to do sit-ski for 2km. The general opinion gathered is that the program is good and is worth emulating by all people who believes in equality in terms of human rights and opportunities for everybody. However there is very little objective evidence in the research literature and therefore there is need for evidence based practice at BHSS by conducting objective tests and measurements. If all this activities is to command respect in the field of medicine, rehabilitation and education then more empirical studies need to be undertaken (DePauw, 1986). There was need for a psychiatrist at the centre among the multidisciplinary personnel at the centre.

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AGE RELATED DIFFERENCES IN HUMAN CORTICOSPINAL EXITABILITY DURING SRT IN YOUNG ADULTS AND ELDERLY SUBJECTS EVALUATED WITH TMS

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Key Words: Transcranial Magnetic Stimulation, Reaction time, Excitability & Corticospinal tract.

The main aim of the study was to evaluate the corticospinal excitability profile of young and old adults as a measure of the integrity of the CNS during simple reaction time (SRT). In order to determine the difference between the two groups. Analysis of variance (2x2 ANOVA) with GROUP (elderly versus young adults) and SIDE (right level more versus left hand more) as factors was used to analyze the data. Contrast analysis was performed to know how the two groups differ in terms of their corticospinal excitability. Our observations showed significant ($P=0.003$) changes in the levels of excitability during the merits of the right versus left hands in older adults, which indicate that their inter hemisphere inhibition is low. On the other hand the young adults exhibited better inhibition control with a non-significant difference between the left hand move and the right hand move. In this respect, we suggest that the differences noticed could possibly be due to the age related changes that accrue to the corpus callosum or other cortical structures including the spinal motor neurons. The difference in excitability profile showed mutual build up in the elderly group as compared to the young adults who showed an immediate sharp rise ready for the reaction cue and response. This implies that the corticospinal process of stimulus identification and planning suggests processing time takes longer in adults. Nonetheless there was an indication of variability in RT both within the groups and between the subjects as a whole.

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SOMATOTYPE AND BMI PROFILES OF BOTSWANA SPECIAL OLYMPICS ATHLETES

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Introduction

Studies on the somatotype and BMI of athletes with disabilities are very scarce. Those on Special Olympics athletes, particularly of African origin, are even almost non-existent. The aim of this study was to profile and compare the somatotypes and BMIs of male and female Botswana Special Olympics athletes.

Methods

The sampling design was purposive. Study participants comprised 11 male (15.5 ± 1.9) and 15 female (14.7 ± 3.1) randomly selected athletes with mild mental retardation. Measurement of the somatotype components – skinfolds, circumferences, breadths, lengths and heights were taken in line with the standards set by the International Society for the Advancement of Kinanthropometry (ISAK). Somatotypes were estimated with the Heath-Carter method. For the BMI, the procedure as described by Adams (2002) was adopted.

Results

Male participants had a mean somatotype rating of 1.7-2.0-3.3 (SD 2.0-1.1-2.3) while females had a mean of 3.4-3.6-2.6 (SD 1.9-4.6-1.6). Also, apart from the significant main effect of gender, $F(1, 24) = 4.67$, $p = .041$, on the endomorphy component of the somatotype of the participants, gender had no significant relationships: $F(1, 24) = 1.31$, $p = .264$ and $F(1, 24) = .66$, $p = .423$, respectively, at $p < .05$.

Conclusion

The above results indicate that the participants' gender had very slight influence on the somatotype components of the Botswana Special Olympic athletes. The results have implications for the future selection of Botswana Special Olympics athletes and the scientific design of training programs that would prepare the athletes morphologically for such an elite competition as the Special Olympics.

PROJECT "PHYSICAL AND PLURISENSORY STIMULATION FOR PEOPLE WITH DISABILITY"

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Key words: multisensory stimulation (MSM) – sensory integration – gentle care – disability – adapted physical activity.

Introduction

Concerning the attention on the maintenance of the intellectual ability, social relationship and with in the environment by the people with disability, there is now a full consolidated experiences and studies on the plurisensory stimulation (SPs) importance.

The project is on a particular methodology in the field of SPs called “Snoezelen”. This term comes from the union of two dutch verbs, “sufflen” (“to search outside from” or “explore”) and “doezelen” (relax), that underline the sensory aspects of stimulation and relaxation from which Jan Julsegge and Ad Verheul have started in 1975 for the first steps of the sensory stimulation.

Materials and Methods

“Snoezelen” is an approach that uses all the five senses and their interaction. It uses luminous, musical, auditive effects, forms, aromas and tactile surfaces; such effects are produced by specific instruments activated by the therapists in functions of the characteristics of the single subjects. The goal is that to arise interest, to facilitate the orientation space-time and to recognize the determined moments of the day.

The application of Snoezelen is based on:

- ☐ single or combined feelings
- ☐ creation of atmosphere and shared experiences
- ☐ sensory adventures

The project “The Magic Room” created at the Don Gnocchi Foundation Milan begin from the demand to create a specific space adapted, protected and structured, finalized to the plurisensory stimulation.

Some teachers have looked for new stimulations and tools to answer the demands of the students.

So they have realized the “Magic Room”, a space created to live sensory and experiences of pleasure, wealth, relaxation and discovery.

Conclusions

The experience given by “The Magic Room” project is an important slice of the educational interventions realized at the school.

The project is going on since two year and the results obtained are very satisfactory.

The psychological and physical aspect of the students who take part in the project has had remarkable changes; the corporeal contact and the relaxation situations adapted to the person produce quiet, confidence and sensory pleasure. Also the attentive capacities and the use of the residual sensory channels have obtained some improvements.

The “Snoezelen” give the importance on what child is, what he knows, what he do and way he to come in contact with the world to improve the quality of life.

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ADAPTED PHYSICAL ACTIVITY FOR THE BLIND PEOPLE

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Key words: adapted physical activity, blind people, chinesiology, global postural reeducation (RPG), balance and relaxation.

Introduction

This study originated from the cooperation between APA Italy and ANPVI (National Association for the Blind) of Turin.

Objective

The purpose of the project is to develop a program of adapted physical activity in order to improve the quality of life to blind people, increasing oxygenation and microcirculation through a better postural perception and invigorating the muscular chains, that are good for daily life, for the control of tensions and for the improvement of self-sufficiency.

Methods

This study intends to observe and to test a group of 10 persons with sight deficiency for a period of 10 months.

The suggested physical activity takes place twice a week in a gym of chinesiology and functional reeducation and each session lasts 50 minutes.

6 tests have been used for this project, 5 concerning the physical field and 1 concerning the psychological and emotional sphere:

Isocinetic test; Fukuda test; Test for the balance in bipodalic or monopodalic station; Test of the “2 scales” Test of flexibility; SAT-P.

The physical course planned for this project intends to work on the globality and oneness of the person with special attention to the improvement of the balance, the perception of one's own body, hearing, relaxation and breathing.

For this purpose a programme of adapted physical activity has been developed, for individuals and for groups, of global postural reeducation (RPG) using the music too, as important eutonic means, that is able to cut the muscular hypertone down and to guarantee a more relaxed and efficient biologic environment.

Statistic analysis

Mann Whitney-Wilcoxon test showed significant statistic improvement between SR (starting results) and FR (final results) in Isocinetic Test and Flexibility Test. ($p < 0.05$).

Results and conclusions

First assessments have underlined an improvement in the strength of the lower limbs, in the balance and in the posture in confirmation of the importance of active and passive movement in daily life.

The presentation of this project wants therefore to explain the methodology of work, the test used and the results obtained, underlining the course of physical, psychological and relational changes observed during the activity.

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PHYSICAL FUNCTIONAL LIMITATION ASSESSMENT USING AN INERTIAL SENSING UNIT

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The integration of both movement sciences and bioengineering knowledge allows to design quantitative approaches for the assessment of physical functional limitation, so that relevant pragmatic issues, such as eligibility for adapted physical activity, physical exercise protocol definition, and outcome measure, can be addressed. This assessment should be performed during the execution of transitory motor tasks (e.g. rising from/sitting on a seat, ascending/descending a step) by both acquiring motion data from minimally-invasive and cost-efficient instrumentation and inputting such data to mathematical models of the musculo-skeletal system that embody the invariant aspects of both the modelled system and the specific motor task. As shown in previous investigations of this group [1], the best candidate for this purpose is the acceleration of the whole body centre of mass or of suitably selected point on the body surface. This study investigates the potential use of an inertial measurement unit for that purpose. In particular, answers to the following questions are sought: is the acceleration of the unit, emended from the gravitational acceleration, a sufficiently accurate representation of the whole body centre of mass acceleration when placed at L5 level? Is the displacement estimated using this accelerometric data adequately accurate?

A custom-made wearable and wireless inertial measurement unit (IMU) constituted by a 3D accelerometer and a 3D gyro was rigidly fixed on a subject's body at L5 level (male, age 28, height=170cm, mass=70kg). Centre of mass acceleration was measured using a 6-component force platform (FP) and the displacement of a reflective marker placed on the IMU was measured using stereo-photo-grammetry (SPG). IMU and FP acceleration data (AIMU AND AFP, respectively) and SPG marker position data (PSPG) were acquired simultaneously (sampling rate = 120 samples/s) while the subject performed 5 repetitions of squat jump, a motor task purposely chosen to challenge the experimental setup in terms of artefacts involved. To evaluate differences, the correlation coefficient (r) and the root mean square (RMS) values were calculated between AIMU and AFP, and between PSPG and the displacement (PIMU) calculated as the numerical double integration of AISU [2]. Results demonstrated that AIMU is very similar to AFP (average $r > 0.95$ and $RMS < 5\%$ peak-to-peak value), and PIMU to PSPG (average $r > 0.95$, $RMS < 3\%$ peak-to-peak value). This shows that an inertial measurement unit, placed on a subjects body at L5 level, yields useful information that, when opportunely given as input to minimum measured-input models, can be used for physical functional limitation assessment.

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AGEING, LONG TERM PHYSICAL TRAINING, AND BALANCE: THE REPEATABILITY OF A STABILOMETRIC TEST

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Key words: repeatability of a measure, static postural stability, balance test, risk of falling, elderly athletes.

The aims of this study are to assess the repeatability and precision of a measure of static postural stability in a group of elderly athletes. Aging and inactivity are associated with a decrease in balance abilities that, in turn, increase the risk of falling. The present study investigated the effects of age and of a prolonged physical activity on balance capacities in two groups of elderly (>65 years) subjects: endurance and power trained athletes. We are interested in examining the relationships of these physical components for elderly athletes of power and endurance sports since findings will permit to design more specific exercise-based intervention programs aimed to improve balance and prevent falls during elderly. We assessed repeatability of a number of significant variables obtained during stabilometric test on a single force plate. Three stability tests were registered for each subject standing with one leg, one after the other, eyes open, for a total of six tests. Moreover, three stability tests, in narrow stance with eyes open and three tests with eyes closed. Hence, subjects performed twelve quiet standing trials in each of the three test sessions, settled on different days. Repeatability was investigated using Interclass Correlation Coefficient (ICC) and the Standard Error of the mean between subjects (SEMb) and within subjects (SEMw). The standard deviation in the anterior-posterior (A-P) and medium-lateral (M-L) axis, the average speed in A-P and M-L axis (mm/s), the perimeter length (mm) and the ellipse area (mm²) described by the COP have SEMw and SEMb in the range 5 - 10%. Moreover, since both the average speeds (A-P and M-L) and the perimeter length described by the COP would be the variables suited to quantify balance performance and to track it in time. In all the four conditions correlation coefficient (CC) showed that the average speed in A-P plane was positively correlated with the perimeter length ($r>0.85$; $p<0.05$) and also the average speed in M-L plane ($r>0.89$; $p<0.05$). The standard deviation in A-P plane was positively correlated with the ellipse area of the COP ($r>0.82$; $p<0.05$) and also the standard deviation in M-L plane ($r>0.86$; $p<0.05$). In narrow stance in both visual conditions, the average speed in A-P axis was positively correlated with the average speed in M-L axis ($r=0.85$; $p<0.05$). From the analysis of the Mann-Whitney U test we can concluded that endurance trained athletes have worst one-leg stance in eyes open and closed condition ($p<0.05$) than power group. On the contrary, in narrow stance, power trained athletes show an increase of postural sway for ellipse area and standard deviation in A-P and M-L plane in both visual conditions ($p<0.05$).

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LONG TERM BENEFITS OF A SIX MONTHS ADAPTED PHYSICAL ACTIVITY TRAINING PROTOCOL IN SEDENTARY ELDERLY

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Key words: adapted physical activity, exercise, training, elderly, functional evaluation.

Introduction

Physical activity produces several benefits on health. Lesser is known about the lasting of that benefits after detraining, i.e. inactivity after a period of structured physical activity. The aims of the study were: studying the effects of a six months duration moderate intensity training program on cardiovascular parameters and on physical efficiency; verifying if after a subsequent six months period of detraining that benefits still exist.

Methods

To accomplish our purposes, 80 over 60 aged sedentary subjects, without invalidating illness, were enrolled. Before starting the observational period, 18 months, all subjects underwent a clinical assessment (particularly focused on resting and submaximal ergometric effort, on a cycloergometer, ECG, heart rate and arterial pressure registration), and functional evaluation by means of the following tests: 2 minute walk test (2MWT), repeated chair stand test (RCST), timed up & go test (TUGT), 1RM test. All subjects were randomly assigned to 2 subgroups ("A" and "B").

The observational period has been divided in 3 phases, each one of 6 months duration: the first one represented the training phase for "A", while "B" continued to be sedentary; the second phase represented the detraining phase for "A" and the training one for "B"; the third phase represented the detraining phase of "B". Both groups underwent clinical and functional evaluations at the end of each phase.

Training protocol: 1 hour per session, three times a week, for six months. The 40-50% of heart rate reserve and 50% of 1RM were set as upper limits of training intensity.

Results

"A" (20 male and 20 female) mean age was 68 ± 5 years, body mass 74 ± 18 kg, height 166 ± 9 cm (13 drop out); "B" (20 male and 20 female) mean age was 69 ± 5 years, body mass 70 ± 11 kg, height 166 ± 8 cm (13 drop out). Statistical analysis showed no significant differences between "A" and "B" at the first evaluation and after the training phase. Both groups significantly improved in all parameters after training. "A", after detraining, significantly worsened in all parameters, maintaining only cardiovascular parameters significantly better than before training. "B" group's after detraining data are expected on next September.

Conclusion

Our data suggest that a moderate intensity training protocol determines benefits in both cardiovascular and functional parameters; that benefits still remain after a six months detraining period only in cardiovascular parameters.

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: EFFICACY OF ADAPTED PHYSICAL ACTIVITY IN SUBJECT WITH MENTAL RETARDATION INSTITUTIONALIZED

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Key words: Adapted Physical Activity, intellectual disability, physical training, well-being.

From some years in the Fondazione is developed a regular APA for institutionalized subjects with mental retardation with a systematic estimation of the effectiveness of regular physical activity in terms of improving quality of life, physical performance and muscular mass.

All the subjects are periodically submitted to multidimensional assessment, physical examination, functional status (Barthel Index and Lawton Scale for instrumental activities of daily living), risk of fall (Tinetti Scale), affective-cognitive status, the behavioural symptoms (Neuropsychiatry Inventory) and status of health (Severity Index and Comorbidity Index of Cumulative Illness Rating Scales). We measure also the biceps and calf circumference and the physical performance are assessed by Walking Test (WT 6 minutes).

The subjects involved, carry on intense physical activity ninety minutes twice a week in a gymnasium equipped with supervision of a teacher ISEF. Nursing home physician and teacher ISEF were agreed on the personal program for every participant. For every subject was created a personalized card of work. Monthly the physician and the teacher ISEF verify the performances of subjects. Our activity show that continuous physical exercise is a basic element in order to guarantee psycho-physical well-being to institutionalized patients

The results reached to all today have allowed us to increase the base of the frequenting ones and to plan programs of widened APA.

Some studies are in progress on groups of patients submitting the subjects to a series of evaluations with the execution of anthropometric and functional measures more detailed in comparison to how much already realized; adopting new tools (utensils for the mobilization personalized) and experimenting new strategies to improve the learning of the motor (memory training) gesture.

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GOAL BALL RELATED INJURIES AMONG IRANIAN ELITE FEMALE

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Key words: goall ball, injury, female, elite athlete.

Introduction

Goalball was established to help rehabilitate blinded war veterans in 1946. It was introduced to the world at the 1976 Paralympics in Toronto, Canada. Since then Goalball has increased in popularity and is now played globally¹. However there is little data regarding the incidence and the rate of sport related injuries in this sport.

Issues

To review one year injury frequency data for women's goal ball and identify potential areas for injury prevention initiatives.

Research method

Using a questionnaire, the sport related injuries among 36 players with the minimum of 3 years experience in national Iranian goal ball team were collected. Interview was used to get more specific details in some cases.

Results and discussion

The subject's mean of age was 24 (± 5) mean of height was 162 (± 9) and weight was 59 (± 6). The mean of blindness and VL was 16 years. Birth Related Causes was the main reason for VL among the subjects. All of the subjects reported some injury experience in goal ball. In total 187 injuries reported. Many goal ball related injuries occur in the upper limb (%37.8) followed by lower limbs (%34.4) and other limbs such as trunk, head, face etc (%28.3). In upper limbs, more injuries reported in hands and wrists (%53.3), in lower limbs in knee (%25.5), in other areas, abdomen and face. Results showed tipology of more frequent injury of muscular-tendon (%59.4), joint and ligament (%32), skin (%7.5) and bone (%1.6). Interviewing the players and the coaches, it was reported that the technical fault, non standard facilities around the play yard and bad court surface conditions was the associated factors in goal ball related injuries. As goalball athletes spend the majority of the game throwing themselves onto the ground to block the ball, injuries in upper limbs and especially contusions (bruises) on this areas are very likely². If the equipment and the court surface are not up to the standards, then the rate of injury among goal ball players even could be rise.

Recommendations

Providing standard equipment (goal post, cloths, and good court surface of the ground) as well as evidence-based injury prevention interventions (eg, protective equipment such as taping/bracing) and educating good techniques may be viable prevention initiatives for reducing injury rates in women's goal ball players.

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LEISURE-TIME PHYSICAL ACTIVITY OF CHILDREN WITH A LONG-TERM ILLNESS OR DISABILITY IN FINLAND

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Key words: physical activity, long-term illness, disability.

The knowledge base concerning the prevalence of childhood long-term illness or disability is limited. The prevalence of young people with long-term illnesses and/or disabilities in Finland is 10-20%, depending on the method of classification.

Physical activity is assumed to have special benefits for children and adolescents with disabilities: not only in terms of better coping with a disability and decreasing symptoms, but also socialization into peer groups. Children with physical disabilities are frequently excluded by classmates and discouraged from participating in such typical childhood experiences as physical activity. This kind of isolation may lead to voluntary avoidance of physical activity later in life.

The purpose of this study was to examine, first, the prevalence of children (13 and 15 years of age) with a long-term illness or disability in general education in Finnish schools. A further purpose was to assess the leisure-time physical activity frequency and its duration among children with and without a long-term disability. The sample consisted of Finnish pupils (n=3459) in 7th grade and 9th grade. The study used the data from a WHO-coordinated cross-national survey of school children's health and life-style (Health Behaviour in School-Aged Children, the HBSC Study). Every fifth (19.8%) of the pupils had a long-term disability, illness or medical condition (e.g., allergy, asthma, diabetes), but 51% of them experienced no difficulties in daily life. The most common difficulty was related to breathing, followed by moving. There were no differences between girls and boys. Children with a long-term illness or disability were equally active whether or not they reported (disability related) difficulties in daily life. In addition, children with a long-term disability were as active as those without a long-term disability. There were differences among boys and girls, and within age groups. However, the only statistically significant difference was that the 13-year old girls with a disability were more active than those without any disabilities. The pupils with a disability were as active as the pupils without a disability. Future research should address the different determinants which are involved in daily life and/or sports that either support or hinder physical activity.

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APA PROGRAMME OF YOUNG AND ADULT RECOVERING DRUG ADDICTS UNDER RESIDENTIAL CARE

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Keyword: drug addicted, motor abilities, physical self-concept, mental health.

Objectives:

To evaluate the effects of different training protocols (football with five people and acrosport) on the motor abilities and on the physical self-concept of young individuals and formerly drug addicted adults under residential treatment.

Methods

Sample: 12 men, aged between 19 and 35 (M 28,5 \pm SD 4,93). 24 sessions of 60 minutes each twice a week have been planned. For the evaluation of the motor abilities the tests Eurofit for adults (Oja, Tuxworth, 1995), the Six minute walking test and the Step test (Rikli, Jones, 1999) have been used. For the assessment of the physical self-concept we have used the Italian version (Maleddu, Scalas, Guicciardi, 2002) of the Physical Self-Description Questionnaire- PSDQ (Marsh et al, 1994).

Results

From the results of the Eurofit test for adults, the most influenced abilities have been flexibility and abdominal muscular resistance. From the analysis of the data of the six minute walking test and of the step test we found that the performances of the participants were the same or slightly higher than those of the normative group of 60 years old. The analysis PSDQ points out a very significant correlation ($p < .01$) in the retest between the subscales SPRT and COOR ($r = .832$), ESTM and BFAT ($r = .788$), FLEX and COOR ($r = .712$), FLEX and SPRT ($r = .715$), ESTM and GPSC ($r = .903$).

Pearson's correlations between the tests Sit and Reach, Standing Broad Jump, 50 m Shuttle Run, BMI and some subscales of the PSDQ (Flexibility, Strength, Endurance and Obesity) revealed a significant negative correlation ($p < .05$) comes out in the test between the Endurance test and the Endurance subscale of the PSDQ ($r = -.601$) and ($p < .01$) between BMI and the body fat subscale of PSDQ ($r = -.854$). In the retest there is no significant correlation between motor tests and the subscales of PSDQ while is evident a significant negative correlation ($p < .05$) between the BMI and the body fat subscale of the PSDQ ($r = -.854$).

Discussion

This study point out limited effects of the training on the motor abilities of the participants due to the alterations of the functions or systems in the body that drugs addiction causes.

The results of PSDQ show that the physical self-concept is still dysfunctional. Therefore, further research is needed to define a dose of physical activity necessary to improve motor abilities and to examine relationship between physical activity and various aspects of mental health for drug addicted treatment.

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ISSUES IN THE IDENTIFICATION OF DEVELOPMENTAL COORDINATION DISORDER (DCD)

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Key words: DCD, identification, self-perceptions.

When identifying motor difficulties such as DCD, there is dissension as to what cut points should be used in research and intervention. These cut points are generally based on motor performance test scores and range from the 5th to the 15th percentile. The adoption of the lower point should be challenged because many children, who also have movement related psychosocial difficulties and low fitness, may not be identified. Two limitations arise from using the 5th percentile as a cut-score: a) given the multi-causal nature of DCD, research using a low cut-off might limit what we can ever know; and b) the research findings will have limited generalisability to future practice. The controversy surrounding cut points, and the heterogeneous nature of DCD, highlight the need for more data-based work to broaden our understanding of the limitations we impose by selecting a specific cut point.

Our purpose was to identify clusters based on fitness and physical self-perceptions of adolescents with extremely low to marginal motor performance scores. We looked to see whether these clusters provided support for a motor performance cut point that was 2 SD below, 1.5 SD below, 1.25 SD below or 1 SD below the mean of the MAND Neurodevelopmental Index (McCarron, 1997). The 14-year-old participants (N = 317) completed the athletic subscale of the Self-Perception Profile for Adolescents (Harter, 1988), three questions on enjoyment and ability in physical activities, and fitness measures: BMI, upper limb strength; abdominal endurance; flexibility; and PWC170.

A two-step cluster procedure (SPSS v.15) that deals with categorical and continuous data, yielded two clusters. Cluster 1 (n = 182) was characterized by significantly better strength, endurance, a lower BMI, and more positive physical self-perceptions than Cluster 2 (n = 135). The cut point groups were distributed through both clusters. The poorer performing Cluster 2 comprised 60% of the SD2 group, 36% of the SD1.5 group, 38% of the SD1.25 group and 46% of the SD1 group. Gender differences were also apparent, 53% of girls and 32% of boys were in Cluster 2.

The data indicate that all participants in Cluster 2 are at risk of low participation in physical activity and support the use of a generous cut-point in the identification of DCD.

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OBESITY AND PHYSICAL ACTIVITY AMONG ADOLESCENTS WITH MENTAL DISABILITY

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Key words: obesity prevalence, % fat mass, waist circumference, BMI, mental disability, physical activity.

Introduction

Reduction of obesity prevalence is one of the main stakes of the XXIst century. Obesity increases exponentially, hitting particularly youngest generations, up to 35.8% of overweight or obese children in Europe, and 18% in France, but little is known about people with mental disability (MD). The present study investigates prevalence of obesity among MD children-adolescents attending specialized school in the Rhône Alpes region (France), and the relationship between obesity indicators and Physical Activity .

Research methods

Anthropometric assessments were conducted: weight, height and calculation of BMI, waist circumference (WC), and assessed by “bio-impedance” [Bodystat[®]1500]. Actually, 142 healthy volunteer children-adolescents with MD participate to the study (84 boys and 58 girls, aged 7-18 years). The activity level was evaluated using PA questionnaire: PAQAP[®], allowing estimation of VO_{2max} according to the usual PA.

Results

According to the threshold of the 97th percentile for the BMI, 20.24% of boys and 24.14% of girls are found “obese”. Considering fat mass (FM)[1], and waist circumference (WC)[3] makes thinks even worse: over FM is found among 48.19% of boys, and 57.14% of them are identified with health risk WC. Among girls, figures are 63.79% for FM, and 89.65% for WC.

The study of the relationship between obesity and PA was conducted among adolescents (N=97). Regression analyses showed that significant highest levels of FM and WC were found among less active adolescents (respectively: $r = 0.3173-0.4647$ ♂ and $r = 0.4546-0.7258$ ♀, $P < 0.001$). When adolescents are dispatched into lean/standard and obese sub-groups, VO_{2max} is significantly lower among obese adolescents than their leaner peers ($P < 0.05$).

Discussion

At the stage of the study, the results enhance awareness of the high prevalence of obesity among these adolescents and there risk comorbidities development. The consequences will be increases of restriction of participation and health troubles. Fifty five percent of students participating at this study have higher fat mass, and more than 70% have a higher level of abdominal fat which is related to the development of cardiovascular and metabolic disease [3].

Important links are underline between obesity and higher sedentary life style, as can be find in literature [2]. On the other hand, PA benefits were demonstrated especially for reducing WC and increasing cardiovascular fitness. That why, at the same time as increasing the number of participants, we are going to pursue this study focusing on obesity prevention and/or weight lost training by Adapted Physical Activity for this population.

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GAIT ANALYSIS FOR DIABETIC FOOT PREVENTION

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Introduction

Diabetes mellitus is a chronic disease widely diffused in the population and continuously increasing. The disease long term complications are multiple and invalidating, among these the diabetic foot, drifted from the contemporary presence of peripheral neuropathy and vasculopathy, that altering the biomechanics of the foot, can carry to callosity formation and ulcerations. The social and economic weight of the diabetic foot can be reduced through a prompt diagnosis and treatment from the very beginning.

Material and Methods

In the present study were presented the results of a wide clinical investigation conducted on 38 subjects, 10 healthy (C) and 28 diabetic patients, in order to assess the function of the diabetic foot patients. Therefore a combined test obtained by means of posture analysis [1], gait analysis and stair ascending and descending [2] test was used. In order to provide a simple and effective description of the execution of the motor tasks, movement analysis was performed by means of a 120-60 Hz 6 cameras stereofotogrammetric system (BTS S.r.l, Padova), 2 force plates (Bertec Corporation, USA), 2 plantar pressure systems (Imagotresi, Piacenza). The signals coming from all systems were synchronized.

Results

The present study confirmed that, from a biomechanical point of view, peripheral neuropathy results in significant alterations of gait, not just in terms of foot-to floor interaction, but also at the level of the lower limbs joint complex, in terms of limited joint mobility. This study included also the association of the alterations of the biomechanical parameters measured with concurrent alterations of physical and clinical parameters of diabetic patients, with or without neuropathy. More specifically, the study highlighted the following alterations of diabetic patients gait: loading times percentage increased with respect to the duration of the whole stance phase; push-off time was drastically reduced; lower limbs joint mobility was reduced mostly in the neuropathic and vasculopathic group. Neuropathic patients significantly reduced moments during flexion-extension (sagittal plane) at each joint.

Discussion

Our results shows feasibility of this approach for studying diabetic foot. This study is being extended to a larger sample in order to obtain more statistically significant results.

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ROLE OF PHYSICAL ACTIVITIES IN PREVENTION OF BODY IMAGE DISTRESS

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The present work is meant as a theoretical contribution about body image and physical activities, also useful for a consequent practical perspective.

The concept of “body image” originated in different fields such as the neurological, psychoanalytic, philosophical and psychological ones and was referred to the picture of the body built by the individual. Currently, it can be considered as a multidimensional construction about perceptions and attitudes that individuals refer to their body and in particular to their appearance (Cash 2002).

There is a very common opinion that athletes with “perfect” bodies also have a great satisfaction for their bodies. In point of fact it should be said that physical activities may play the part of both a negative and a positive influence on body image. The body image distress in some gymnasts and the dysmorphophobia in some bodybuilders are typical examples of possible negative influences of sport in this psychological dominion. Anyway it was also showed that athletes have generally more satisfaction for their bodies in comparison with other people. But an interesting fact is that when physical exercises are centered on appearance they influence body image in a negative way, while recreational physical activities influence positively body image. It has also been proved that fitness activities have positive influences on body image through an improvement in body conditioning (endurance, strength and flexibility), body composition, skill learning, perception of wellbeing and self-efficacy (Martin & Lichtenberger 2002).

Finally, we can say that the influences exerted by physical activities on body image depend on more than one variable such as the kind of activities, the gender of participants and the degree of commitment and particular psychological features of individuals (Davis 2002). Some cornerstones should be considered in promoting programmes of adapted physical activities centered on body image distress prevention. First of all, the fact that individuals with a poor body image show greater improvements implies the possibility to obtain good results with people with disabilities; secondly, the activities should have an intensity range from moderate to high; thirdly, it should be borne in mind that enjoyment increases the positive effects of physical exercise on body image; finally, it is very important to focus on the improvement of physical function, strength and endurance rather than on changing in physical appearance.

STRESSORS IN COMPETITIVE WHEELCHAIR BASKETBALL A QUALITATIVE INTERVIEW STUDY

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Key words: wheelchair basketball, stressors, performance.

Introduction

(Peak) performance in wheelchair basketball requires both highly developed physical and psychological skill levels. In (wheelchair) basketball, effective stress coping is seen as a crucial factor to reach the best performance in competitive games. Therefore, it is important to know stressors players are encountered through competitive games. The following study focus exclusively on stress sources in competitive games, non-competitive stressors are not in our focus (see Campbell & Jones, 2002).

Method

In the year of 2006, eleven head coaches of elite-level German wheelchair basketball teams were interviewed. The coaches were holders of the highest coaching certificate and current or former coaches of national teams and Division 1 German club teams. They were experienced in top-level coaching as well as playing. The participants represented the whole range of IWBF-classification system. Structured interviews were conducted. After defining the terms stress and coping, the coaches were invited to report about important stressors in competitive games. It was stressed to focus on situations and conditions of interest for basketball in general as well as those typically emerging in wheelchair basketball. The interviews were analyzed with qualitative methodology, especially with inductive content analyze.

Results

We found two general dimensions resulting from 14 first and seven second-order themes. The general dimensions can be named as external vs. internal stressors. That is, the latter are closely associated with the own team, coach, and playing behaviour. Conversely, the first address the opponent and environmental conditions (players, coaches, playing behaviour). In regard to internal stressors, second-order themes are named wheelchair (e.g., a broken chair), own coach (e.g., substitutions despite good performance), teammates (e.g., ineffective communication), and own playing behaviour (e.g., failed blocks). External sources of stress are the playing time (e.g., decisive last minutes), referee (e.g., wrong decisions), and opponent (e.g., provocation).

Discussion

The study details competition related stressors. The findings show that there are sources of stress being very similar to those of able-bodied basketball (e.g., wrong referee decisions; failed throws) and others unique for wheelchair basketball. Especially technical problems with the wheelchair, falling out of it, substitutions because of not exceeding the allowed team-balance (14 player's points) instead of playing poor, or unrealistic expectations of the coach in regard to stronger impaired players seem to be such stressors. Hence, sport psychology consultants should conduct PST programmes – also – to address these sources of stress.

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ELDER AGE AND DIABETES 2: HOUSE ASSISTED PHYSICAL ACTIVITY

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Key words: diabetes 2, personalized activities at home, guide Canada's physical activity.

Introduction

The project, carried out in cooperation with the Diabetology ward of *Ospedale Oftalmico di Torino, Circoscrizione 10* and *SUISM*, consists of the implementation of a course of "home assistance physical activity" for people affected by type 2 diabetes, the elderly and overweight, who do not participate to APA activities in the gym, because they suffer from motion problems, have low motivation, and / or an inactive lifestyle.

Goal

The importance of physical activity for diabetics is acknowledged, but usually medical recommendation is not respected. The aim of this project is to try and modify this lifestyle, so that these people will feel more comfortable with gym activity.

Method

Work is carried out individually in the subject's home. First of all, they were given a questionnaire to be completed, in order to become familiar with their daily routine, and motion problems. The group consists of 29 subjects, divided into 3 subcategories, monitored by 3 final year students. We proposed a weekly personal file. Different and personalized activities are proposed every day.

Each daily file requires 30 minutes activity which can be spread over the course of the day, simply 10 minutes at a time if so desired. The key aspect of this lies in such activity into the subject's daily routine (taking care of themselves, their homes, their families), being followed by our proposed activities at home, establishing a strong link of trust. This should allow the subjects to perform regularly and continuously through the day. We used evaluation tests concerning motion, and a questionnaire on life quality.

Final Comments

One of the main problems we have faced has been initial distrust, as well as the difficulty of verifying the subject's commitment to the project in our absence. Even if the project is still in the pipeline, we observed a better understanding in the delivery and execution methods. We were also pleased to observe an increase in initial motivation, and for some, an improved lifestyle (for instance, some now enjoy going for a walk, whereas initially they preferred to stay at home). At present, we are thinking of formulating a system of standardized testing, in order to produce assessable, accurate scientific data.

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SPORT AND DISABILITY IN THE ITALIAN SCHOOL

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Key words: Didactic Programmes, Teacher training, Professional competences, Handicap.

The scientific reflection is finalized to the location and the analysis of the professional employed competences in the Italian school for the promotion of sports for disabled through a study of the evolutionary distance that has accompanied the teaching training. The comparative analysis of the legislative Italian procedure and the various programmatic indications from the Casati's Law of 1859 to the recent Indications for the Nursery School Curriculum and the First Educational Cycle of 2007 has pointed out a slow and potential graduated process of interest for the social educational integration of disabled accompanied to a reconsideration of abilities and plurals unexplored capabilities and potentially interacting in the motor field (OMS, 2001). The law n.104, 1992 besides previewing to article 23 to support and to promote without any limitation the sports practice for disabled, has established the obligation to assign a specialized staff into the school, contextually adapting equipments and educational staff, sports and free time and adopting a co-ordinate programming of the services you drained to us with those recreated and sportswomen to you managed from private public agencies and. The transformations in the Italian university system, the birth of four-year distances of bachelor finalizes the teacher formation in the school of infancy and primary with competences in the field of the disability, the existence of a previewed "extraordinary" formation from the qualifying course and a schools of specialization for the secondary instruction comprehensive of curriculums of additional Didactics, evidence the attempt of the Italian formative system to comply with law 104 through distances not always adapted to the particular requirements of the disability. A study that puts into effect the curriculums for the formation of teaching specialized for the instruction to the disabled pupils, compared to the analysis of the enforced programs of 1985 and of 1982 relatively to the destined part to the motor education and the physical and sport education, that highlights a total inadequacy. The inclusive specificity of the motor and sport field in educational areas, its potentialities, its rieducational aspects and the adaption, would demand the marking of an epistemological frame of the integrating-educational depositor of the destined scholastic sport of disabled. An epistemological base of the propedeutical field to the definition of the knowledge, the abilities and the indispensable resources to the instruction would demand a reconsideration of the relationships between areas of search of sciences of the education and motor-sports sciences, reaching to the wealth to interdisciplinary of the neuroscience. The development of the sports activities for the disability would demand moreover the construction of specific competences, informative-orientative, of the teacher specialized in this field, in those base and t physical and sports education, indispensable to the definition of extrascholastic sport opportunities and to the construction with the various subjects of the territory (CIP, Special Olympic, Associations of the field, etc), of support nets of the right to the sport.

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CONFIRMATORY FACTOR ANALYSIS OF THE 18-ITEM STANDARDIZED ASTHMA QUALITY OF LIFE QUESTIONNAIRE- AQLQ(S) IN GREEK ADULT PATIENTS WITH ASTHMA

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Key words: Construct validity, Asthma Quality of Life Questionnaire-Standardized, AQLQ(S).

Introduction

The present study was designed to examine the validity of the 18-item Standardised Asthma Quality of Life Questionnaire-AQLQ(S), through a confirmatory factor analysis, in a sample of 223 Greek adult patients with asthma.

Method

The sample selection was purposive and the participants were 223 Greek adults (65 men and 158 women) with current asthma, all out-patients of the asthma department of the 'Amalia Fleming' Hospital in Athens, Greece. The 18-item AQLQ(S) (Grammatopoulou et al., 2008), derived from the 32-item AQLQ(S) (Juniper et al., 1999), was administered to the participants. The questionnaire consists 18 items grouped under four factors: Symptoms (5 items), Activity Limitations (6 items), Sleep (3 items) and Exposure in Environmental Stimuli (4 items). Grammatopoulou and colleagues (Grammatopoulou et al., 2008; Grammatopoulou et al., 2007) have reported sufficient construct validity, cross-sectional validity and responsiveness, along with satisfactory test-retest reliability and internal consistency evidence, in Greek patients.

Results-Discussion

The confirmatory factor analysis provided further construct validity evidence for the 18-item AQLQ(S) (e.g. χ^2/df ratio = 2.47, NNFI = .93, CFI = .95, SRMR = .05). Furthermore, the questionnaire showed a high internal consistency (Cronbach alpha reliability coefficient ranged from .82 to .96). Overall, the 18-item AQLQ(S) may be used with more confidence in the future for the assessment of quality of life, in Greek adult patients with asthma.

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OVERWEIGHT AND OBESITY AMONG GREEK CHILDREN WITH MENTAL RETARDATION AND THE INFLUENCE OF PARENTAL NUTRITIONAL HABITS

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Key words: overweight, obesity, mental retardation, nutritional habits.

Introduction

The aim of the present study was to investigate the frequency of overweight and obesity among children with moderate mental retardation. A secondary purpose was to examine the relationship between the body mass index (BMI) of children with mental retardation with: a) the nutritional habits of their parents and b) the intention of their parents to adopt healthy eating.

Method

The participants were 73 children, 17 girls and 56 boys, between 7 and 12 years old, from public special elementary schools in Athens, Greece. Further, a total of 41 parents participated by filling out the Planned Behavior Theory (TPB)(Ajzen, 1985) and the Consuming Food Frequency (CFF)(Cavadini et al., 1999) questionnaires. The SPSS was used for statistical analyses.

Results-Discussion

The percentages of mentally retarded children with obesity and overweight were 20.5% and 28.8%, respectively. Furthermore, it was found that the girls had higher percentages of obesity (23.5%) and overweight (42.2%) in comparison with the boys (19.6% and 25%, respectively). Comparison of our findings with a control group of Greek children without mental retardation revealed that children with mental retardation had higher percentages of obesity (Lin et al., 2005). Further, the BMI scores of children with mental retardation and their parents were positively related (mothers: $r = .295$, $p = .128$; fathers: $r = .081$, $p = .814$).

The parental responses concerning nutritional habits were related to the BMI of their children. In addition, the intention of parents to adopt healthy eating was in general positive. Significant differences though were found between the responses of mothers with overweight and obese children, regarding their attitudes to adopt healthy eating. Particularly, the mothers of obese children had more positive attitude than mothers of overweight children. Further, the “perceived behavioral control” of the mothers was the only significant factor predicting the children’s BMI. Concerning the father’s responses, interesting findings emerged for the subjective norm factor. Specifically, the fathers whose children participated in physical activities scored higher in the “subjective norm” factor than fathers whose children did not participate.

Finally, regarding the examination of nutritional habits, the results showed that there was significant difference with respect to the consumption of lactationally products. Specifically, the mothers whose children participated in physical activities were consuming higher amounts of lactational products comparing to mothers whose children did not participate. Overall, the present findings are indicative for the frequency of obesity for children with mental retardation and the parental role in Greece.

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PEERS AS RESOURCES FOR LEARNING. A SITUATED LEARNING APPROACH TO APA IN REHABILITATION

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Key words: Rehabilitation, Wheelchair activities, Situated learning.

Introduction

A number of recent studies have pointed to the value of disability-specific settings in APA (cf. Goodwin & Staples, 2005). These studies draw our attention to the ways that peers can be resources for each other. However, none of these studies have investigated the learning outcome of such peer interaction. The purpose of this study was to investigate the learning that took place when people with disabilities interacted in a rehabilitation setting.

Theory

Situated learning provides “a conceptual framework for thinking about learning” (Wenger, 1998: 11), where acts are not explained and understood in light of the mental states of the individual, but rather “in terms of what goes on between individuals, and between individuals and situations” (Marton & Booth, 1997: 11). More specifically, situated learning gives primacy to the learners’ perspective and active involvement in the learning process. In the context of this study, situated learning provides a lens through which we can study the learning that happens in addition to – and sometimes in spite of – the activities controlled by the rehabilitation professionals.

Method

A explorative investigation was undertaken. Data were generated through qualitative interviews and close observation. The context of the study was a rehabilitation program consisting of basic wheelchair skills and adapted physical activities. This case was chosen, because the participants represented a wide range of skills and experiences, from novices to experts having used wheelchair for 30 years.

Results / Discussion

The analysis of the data revealed four themes: (a) *learning together*, (b) *understanding my struggles*, (c) *getting a measuring stick*, and (d) *the wheels are my shoes*.

The results and discussion indicate that peers are a resource for each other’s learning in a variety of ways: they act as models for imitation, regardless of whether this is intended by the instructors or not. Also, peers are discussion partners who can help each other to find solutions to common challenges and be critical discussion partners. By having a variety of skill and experience levels, newcomers find measuring sticks for where they stand and orientation points for where they can go. By both giving and receiving help, the participants in this study contributed to the development of others as well as developing themselves. Through discussions and interactions, participants developed a language in which to make sense of their situation as wheelchair users.

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EVIDENCE BASED PRACTICE IN ADAPTED PHYSICAL ACTIVITY: A CRITIQUE

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Key words: Evidence-based practice, Professional practice, Critical examination.

Both in the health care sector and the educational domain, evidence-based practice (EBP) has been heralded as *the* method to improve practice and to bridge the theory-practice gap. To a very limited degree, EBP has been debated in APA. An exception is Hutzler (2006), who defines it as “the conscientious, explicit and judicious use of current best evidence in making decisions about the professional service provided to participants in APA programs” (p. 13).

In this presentation I shall, by way of employing philosophical arguments, offer a critique of some of the assumptions underlying EBP, as it relates to professional practice of APA. In order to do so, I will first describe what kind of practice professional practice of APA is. By drawing on central texts in APA, I will maintain that professional practice of APA requires meeting the participants in a learning situation, rather than a treatment situation. It is thus an educational, rather than a medical practice. This is consistent with the critique of the medical model of disability advanced in the APA literature.

Further the presentation draws on the critique mounted against EBP in the educational domain (cf. Berliner, 2002; Biesta, 2007). More specifically it will be argued that:

- (1) the hierarchy of knowledge specified by EBP is perhaps suitable for medicine, but it's relevance for an educational model of professional practice in APA must be questioned.
- (2) a conceptualization of professional practice as an intervention is not sufficient for APA
- (3) the strong emphasis put on self-determination in APA is in conflict with underlying assumptions of EPB

A critique of EBP is not the same as a rejection of the idea that research can inform practice. Therefore, the presentation will end with a positive reconstruction of the possible benefits of Evidence-based research in APA. This also involves the claim that the notion of evidence should be re-conceptualized and broadened.

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THE IMPACT OF THE EFFECTIVENESS OF THE USE OF FORCE FUNCTIONAL EXERCISES ON SOME SKILLS AND PHYSICAL VARIABLES AND DYNAMIC PERFORMANCE LEVELS AND THEIR RELATIONSHIP TO THE PLAYERS HANDBALL

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Introduction

The training of the force career included multiple movements trends multi-directional and lead exercises by focusing on one side, making it a single limb of the best exercises used to improve muscle strength Center (mid-body) and balance and functional exercises aimed at reducing the power generated through the slow movement of joints and lead movements in the multi-layered and integrated does not depend on external stabilizers, but the backbone is used to facilitate movement

Goal of research

Research aims to try to identify the effectiveness of the functional exercises of force:

- 1 - variables and physical skills of emerging Handball.
- 2 - to the dynamic changes arising Handball.

Research assumptions

- 1 - There are significant differences between measurements before and after the pilot group of variables in the physical and skills under discussion for telemetric.
- 2 - There are significant differences between the two sets of measurements Badin pilot and the dynamic changes in the law under discussion for telemetric of the pilot group.

Curriculum research

Use a researcher experimental curriculum so as to suitability for research and application procedures, the use of experimental design is a measurement before and after two sets to one pilot and the other officer

Research community sample

Has been selected sample of search arising from the manner intentional hand ball, and the strength of community research (40) stems have been excluded (10) Young Men them to conduct their survey sample into the search (30) stems were randomly divided into two equal one pilot and another officer from the strength of each Sample (15) has conducted an emerging researcher homogeneity in height and weight and age and age training schedule and parity between the two variables in the physical and skills

Tools and devices used

Use a researcher tools and devices for measuring changes following research:

Balance of medical standards - to measure body weight, body Stammer - to measure the body from the high ground, medical balls, ropes sided, the weight of different weights, a Swiss Balls

Treatments Statistics

Use the following statistical researcher treatments: Average - the standard deviation, a test T, correlation coefficients

Discuss the results

- 1 - a statistically significant differences between the two sets of measurements Badin experimental measurements in the law firm balance and muscle strength back and Athletic crooked ball for telemetric of the pilot group.

The researcher attributed to the impact of the proposed functional strength exercises to improve those variables and physical skills

- 2 - a statistically significant differences between the two sets of measurements Badin pilot and officer in the dynamic measurements for telemetric of the pilot group

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A LONGITUDINAL ANALYSIS OF AN A.P.A. HOME-CARE SERVICE FOR ELDERLY WITH DISABILITIES

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Key words: adapted physical activity, ageing, subjective well-being, self-efficacy, social support, quality of life.

In industrial countries *aging boom* has produced a real emergency, since the society did not prevent the development of frailty and disability of elders. In Italy, laws for wealth and welfare rationalization try to find a balance for assistance of chronic diseases of elderly. Personal autonomy is one of the most important demand from ageing citizens and from society. Diseases, multi-pathologies, inactivity, depression increase the risk of disability and demand of intensive and extensive assistance. According World Health Organization (2002), measures to keep elders healthy and active are a necessity, not a luxury. Regular, soft and adapted physical activity (A.P.A.) can contrast the progression of disability and can improve the quality of life of elderly, as long as possible. A.P.A. is defined as “the whole physical experiences motivated from therapy, rehabilitation, education, recreation or competition” (De Pauw, 2000).

This study takes place in Liguria, the region where the presence of elderly is the highest in Italy (25,4% of people in Liguria are more than 65 years old, while Italy's national percentage is 18,6%). The Course of Bachelor in Sport Sciences of the University of Genoa and the Sanitary Aging Department of Genoa have realized an A.P.A. home-care service. The general purpose of the service is to bring A.P.A. to the elderly at home. Specific aims focus on the improvement of personal autonomy and reduction of pain, increasing subjective well-being and improving self-efficacy. The study investigates some physical abilities and functionalities (Barthel Index; A.D.L.), measuring rising, walking and getting up independence (Timed Up and Go Test), estimating different physical measures of strength, global and district flexibility (Physical Balance Test). The research focuses on subjective well-being (GHQ-12), self-efficacy and perceived social support from significant others. Examined subjects are two groups of elders, former patients of the Sanitary Aging Department, previously physically rehabilitated, in consequence of acute pathological events. The first group of 9 subjects (M = 2, F = 7) (experimental group), whose age varies from 69 to 94 years (medium age: 78 years) have participated since 2003 to the adapted physical activity home program. The second group is composed by 9 subjects (M = 2, F = 7) (control group), whose age varies from 62 to 89 years (medium age: 75). The longitudinal analysis stands out improvement or adaptation of physical activities and deepen the role of some psychosocial factors. In the disability field, successful aging defines a condition associated with wellness and with the possibility for elders to best handle personal autonomy as long as possible. Successful aging is a criterion that distinguishes people who positively grow old from those who experience difficulties and problems (Lang & Tesch-Romer, 1993). From results important suggestions come out, supplying information to develop the theoretical debate on adapted physical activity and aging, useful to support interventions promoting health and wellness.

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BIOMECHANICAL ANALYSIS IN SOCCER, ARTIFICIAL VERSUS NATURAL FIELD AND IDENTIFICATION OF THE RIGHT SOCCER BOOTS TO USE

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Key words: Soccer field, synthetic turf, natural grass, soccer boots, studs, pivot point.

Background

The issues related the artificial grass are well known in terms of maintenance and management, but there is few existing literature on the biomechanical response of these surfaces, particularly if compared to natural grass, moreover the question about the type of shoes to use remain without clear answer. We analyze one of the most critical movement in soccer, the cutting movement, in order to find the answer.

Hypothesis

Many players report different sensations playing on synthetic turf as compared to natural grass. Could this mean that playing on an artificial surface can change the way that athletes play on these surfaces? Is there more risk of injury? What stimuli are generated by the synthetic turf versus natural grass? Which shoes is better to wear? Which shoes is better to prevent injury?

Methods

The study was carried out on 11 semi-professional soccer players. The testing was performed over a 2 year period at a frequency of three times per year. We compared a natural grass surface with 6 artificial grass surfaces using two areas for each test. Two different types of artificial fields were tested, one with SBR infill and the second with thermoplastic material used as infill

The study on the shoes involve, with the same methods, 9 semi-professional players during one season of game.

Results

We recorded higher vibrations in synthetic grass with SBR infill, whereas the synthetic grass with thermoplastic proved to be very close in behaviour to a natural grass surface. The pressure data and the time of contact during testing showed that the field with thermoplastic infill is very similar to natural grass in terms of biomechanical behaviour. Moreover with the same instruments we analyzed the contact pressure results to identify the pivot point of the foot at the moment of a change in direction, useful to identify right shoes. We read a higher pressure in synthetic field respect the natural ones, the athletes develop a higher maximum force in cutting movement on the synthetic surfaces. From the result of this study we projected a new type of shoes with a new technology.

Clinical Relevance

Together with existing literature related to the behaviour of artificial grass surfaces and the shoes used with different stud shape, the results from this analysis can contribute to the discussion as to how we can increase safety and performance on different surfaces, reducing the risk of injuries.

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PHYSICAL ACTIVITY IN LOW BONE MINERAL DENSITY POST-MENOPAUSAL WOMEN

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Key words: osteoporosis, exercise, postmenopausal women.

Introduction

In women with menopause there is an increased catabolic bone turnover due to a decrease of estrogen production which could lead to osteopenia/osteoporosis (1). That entails a bone strength reduction and so a higher risk of fracture.

Exercise is considered one of the most important means for osteoporosis and fracture risk prevention (2, 3), because it allows to maintain and/or improve muscle mass and strength, besides improved balance.

Aim

To evaluate the effects of an adapted physical activity program on bone mass, bone quality and physical function of a post-menopausal group of women with low bone mineral density.

Methods

125 post-menopausal women with osteopenia/osteoporosis underwent a bone mass (Dual-Energy X-ray Absorbimetry, DEXA), bone tissue quality (phalangeal osteosonography) (4), and physical function assessment (handgrip, arm-curl, 2-min step, Modified Sit & Reach, back-scratch, Modified-Clinical Test for Sensory Interaction in Balance (M-CTSIB)). 58 of the participants took part in a 10- month adapted physical activity program (PA), being a multi-component exercise scheme aimed to improve strength, aerobic capacity, balance and joint mobility, performed both on ground and in the water, alternating group and home exercise periods. The other represented a control group (C) that did not exercise. At the end of the exercise program all the subjects were re-evaluated.

Results

With respect to osteosonography, group C showed a significant decrease of all bone quality parameters ($p<0.05$), whereas the PA group showed no differences before or after the program. Regarding the physical function results, there was a significant decrease in handgrip and Modified Sit & Reach tests for the C group ($p<0.05$). The 2-min step and back scratch tests showed stable results, while in the arm-curl test there was a significant increase ($p<0.05$). The PA group, on the other hand, significantly improved for all evaluated physical function parameters ($p<0.05$). Concerning bone mass (DEXA) no differences were detected within and between groups.

Conclusions

The results showed that an adapted physical activity program targeting osteoporosis is useful to improve physical function capacity, to reduce the physiological bone loss and to maintain a good bone quality in a group of post-menopausal women with low bone mineral density.

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EFFECTS OF A BIKE TRAINING PROGRAM ON PATTERNS OF PHYSICAL ACTIVITY IN CHILDREN WITH DOWN SYNDROME

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Keywords: Down syndrome, cycling, physical activity.

Introduction

Children with Down syndrome (DS) have gross motor delays that impact their physical activity (PA) patterns. These delays often inhibit their ability to learn to ride a 2-wheel bicycle without training wheels. Increasing the repertoire of recreational activities of children with DS may increase physical activity levels and decrease the likelihood of excessive weight-gain and associated health risks. Only about 10 percent of children aged 8-15 years can ride a 2 wheel bicycle. The purpose of this study was to describe the effects of a bike training intervention on PA patterns of children with DS over a 1-year period.

Methods

Children with DS ages 8-15 years were randomly assigned to an experimental group (EXP, n=21) or control group (CON, n=21). EXP subjects received a bike training intervention for 5 days while CON subjects received no intervention. PA measurements were taken prior to the start of the bike program (Pre), approximately 2 months (Post-1), and at 1 year post-intervention (Post-2) using an accelerometer for 7 days at each time point. A mixed model analysis was used. Bonferroni's adjustment was used for post-hoc analyses.

Results

Sixty two percent of the participants learned to ride a two wheel bicycle. Time spent in moderate PA (MPA) decreased in CON from Pre to Post-2 while this measure increased in EXP subjects. Time spent in moderate-to-vigorous PA also decreased from Pre to Post-2 in CON while EXP increased their time. Total counts and average counts/min showed similar results. Males spent more time in light PA, vigorous PA (VPA) and total counts of activity. Further analysis of EXP revealed that those who successfully learned to ride had less time spent in sedentary activity and more VPA than those who did not learn. *Discussion:* Teaching DS children to ride a 2-wheel bicycle should be a regular part of their education program and improves physical activity levels up to 1 year post- training. More studies are needed to characterize general PA levels of DS children. A discussion on reasons given by parents why some children stopped riding after they learned to ride will be presented with recommendations to reduce non- riding.

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THE RELATIONSHIP BETWEEN FITNESS VARIABLES & LEVEL OF PHYSICAL ACTIVITY IN DOWN SYNDROME CHILDREN

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Keywords: Down syndrome, physical fitness, physical activity.

Introduction

Research consistently indicates that children, adolescents, and adults with Down syndrome (DS) display major constraints in all areas of physical fitness. Most of this research literature indicates that quality of life and health is negatively impacted as a result of deficits in these fitness parameters. There has been an increase in the number of studies designed to improve muscular strength and endurance in individuals with DS and other intellectual disabilities and many of them have reported meaningful gains following a 12 week fitness treatment program. It is quite common that the researchers make a hypothesis that as a result of increased physical fitness, the participants with DS will be expected to be more physically active. Unfortunately, they seldom test this hypothesis or the hypothesis that when the fitness program finishes following the standard 12 week treatment, the participants will continue to engage in fitness routines. This is a major weakness in some of these investigations resulting in less useful scientific knowledge for professionals in adapted physical activity.

Methods

We conducted a two year research project involving bicycle training and 8-15 year old youth with DS and collected pre-training data on 40 individuals. Measures that were taken on all participants included: height, weight, sum of skinfolds, standing balance on the right and left foot, BMI, and peak knee flexion and extension strength. Physical activity was measured using acticals attached to their trunk for a minimum of 4 days with at least one weekend day. We analyzed the data to determine if there were any relationships between the variables and level of physical activity employing partial correlation controlling for age.

Results

The following significant relationships were found: percent body fat & time spent in light activity ($r = -.32$, $p = .05$), height & time spent in vigorous activity ($r = .36$, $p = .02$). Although there are significant correlations, none of the variables contribute much to explaining the variability in physical activity level. *Discussion:* In the future, we will increase the number of participants in each age group and analyze the relationships by age and after they learn to ride a two wheel bicycle. A discussion of other potential variables that might help explain the variability seen in level of physical activity will be presented including psychosocial variables, emotional, and cognitive development.

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THE INFLUENCE OF A ADAPTED PHYSICAL ACTIVITY ON THE ESTABLISHED POSTURAL OF THE ELDERLY PERSON AS MEAN OF THE PREVENTION OF THE LOSS OF AUTONOMY

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Key words: ageing, adapted physical activity, postural stability, balance, prevention.

The aim of this work was to define the influence of the physical activity adapted on the postural stability on (the) elderly people as means of prevention of the loss of balance one through a program in Adapted Physical Activity (A.P.A.). Used methodology considers the program called PEM (Posture Equilibrium Motricity) that has allowed to study the influence of this practice on the postural abilities of the old people thanks to the specific evaluations of the grates PEM, to the monopodal and to the stabilometric tests with open and closed eyes.

The examined population was constituted by 19 old people between the ages of 70 and 80 years of age divided in two groups, the first one with more men than women and the second one with a higher score of female presence. After 12 weeks of practice, we have put in evidence the influence of this activity on the postural stability of the old people. The three PEM grates determine « the individual motor profile» (PMI), particularly the group B has passed by a score of 69.8 to one of 84.3 on 90; the group C is improved of 8 points. The evaluation of the functional abilities of the tests monopodal and stabilometric show that postural control suffers of the improvements but with some difference within the 2 groups. For the monopodal test both groups, B and C, they have improved in the test of the monopodal open eyes and closed eyes Rx and Lx, where the group B has obtained better result than the group A. In the stabilometric tests with opened eyes the group B has had less difficulty in comparison to the group C to make the examined abilities evolved. For the stabilometric test with closed eyes, the two groups have gotten the same positive results with interindividual differences. On account of this, we have compared the gotten results with the literature's data, and we have brought forth a critical analysis on the benefits and the limits of this type of program on the postural stability of the elderly ones. Results of it that the adapted physical activity addressed to improve the specific elements of the motor control has had a beneficent influence in the postural stability and in the monopodal and bipodal balance. These proposed activities must draw near to a multisensorial program and combined holding in consideration of a person's level and initial potentialities.

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THE INCLUSION: A NEW CHALLENGE FOR THE ADAPTED PHYSICAL ACTIVITIES

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Key words: cultural evolution, "marginalising" paradigm, "differencializing" paradigm, "including" paradigm, disabilities, human categories, inclusive sport, innovation, "Baskin".

Considering the human civilisation as a cultural evolutive process, we notice that the relation that the society builds towards the minorities follows different steps. In a first phase, it seems to dominate the cultural "marginalising" paradigm, with hostile, pitiful or uninterested attitudes... In a second phase, since the process of democratisation demonstrates it more recently, it tends to be recognised progressively the rights of the minorities in the different spheres of the life (education, work and free time), through the creation of different activities that fit to each human category inside institutional specific contexts. The second phase is then dominated by the cultural "differencializing" paradigm. The third phase, which enters a superior degree of cultural maturity, encourages to recompose the unity and the cohesion of this world fragmented in different categories, under the paradigm of the inclusion.

It is necessary to suppose that, as far as it looks after the minority of disabled persons, our society has already started trying the application of the inclusive paradigm, even if essentially inside the educational sphere, replacing the special schools by the inclusive schools. But it is possible to notice how much it is still difficult today to extend the application of the inclusive culture in other fields of the life like the work or the free time, still dominated by the differencializing principle ("special work" in protected contexts, or adapted recreational activities). The recent development of "A.P.A." (Adapted Physical Activities) and the present sporting offer applied to disabled persons demonstrate perfectly as pedagogical engagement is still concentrated at "specialised" proposals and not at inclusive proposals yet: adapted sport or special sport, for persons with physical or mental disability.

The cultural evolution of each field of life, how schematically described above (from the first one to the third phase), follows a trajectory that has its own rhythms. Accordingly, it can be very interesting to observe the original field of the physical education, since really the resulted one of the crossing of two trajectories: that one of the school and that one of the sport. In fact, if on the one hand the educational institution is already compared to the inclusion, giving to the teachers the task of facing a high heterogeneity in class, on the other hand the sporting activities at disposal of the teacher of physical education are not much practicable in inclusion because of their internal logic. It is then necessary to innovate, even if with difficulty, opening the approving cage of the already existing reality, to overcome the second phase and to invent new sporting inclusive practices. The BASKIN in fact is a good example of inclusive innovative sport that is developing in some Italian provinces, starting from Cremona, and that Italy can be proud in our opinion to present to other European countries in occasion of this EUCAPA 2008.

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APA TERMINOLOGY IN CZECH REPUBLIC: COMPARISON OF ATTITUDES OF TEACHERS

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The APA terminology is usually based on English origin terminology. There is not very easy to translate – with the same semantic connotation – into other languages, specially Slavic languages. Language understanding, appropriate polite as well as exact official terminology seems to be very important in the framework communication of specialists (social workers, teacher, educators). Terminology can influence on persons attitudes, attitudes can influenced the terminology. It was the reason of the concept of international study lead by Anna Bianco (2007). Categorical scaled questionnaire (Anna Bianco) was applied to different groups of respondents in Czech Republic. The results – opinions of the teachers – are presented in oral presentation.

Participants

Teachers: obligatory school with children up to 15 (secondary school)

<i>No of participants</i>	<i>aged</i>	<i>years of birth</i>	<i>interview</i>
30	more than 27	1949-1979	22, 23.12.11.06

As there is legislation (school law) about integration, from 0 to several students can attended the schools, mostly wheelchairs or with hearing disability. Teachers can go continuously through different courses and workshops with the topic “integration”, not all of them do it. They can achieve additional education or information in „special education“, not APA. Not everybody does this.

Teachers: obligatory school with children from 15 to 19 (middle school)

<i>No of participants</i>	<i>aged</i>	<i>years of birth</i>	<i>interview</i>
30	more than 27	1949-1979	22, 23.12.11.06

As there is legislation (school law) about integration, 0-several students attended the schools, mostly wheelchairs or with hearing disability. Teachers can go continuously through different courses and workshops with the topic “integration”, not all of them do it. They can achieve additional education or information in „special education“, not APA. Not everybody does this. In comparison of secondary school teachers they have less opportunities for additional education in “special education” or in “integration”. But – as the “class-masters” or “profession -advisors” they should be oriented in future university education for their students.

Results

There are small differences between both groups of teachers, but crucial phenomenon can be considered educational experience and real contact with persons with disability, not the level of school. Contact theory (Sherill) is confirmed. Vocational training including personal practice and experience seems to be necessary for APA understanding, in general.

ANALYSIS OF SERVICE-RETURN EXECUTION OF ELITE TABLE TENNIS ATHLETES WITH INTELLECTUAL DISABILITIES

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Key words: intellectual disability, visual-spatial intelligence, table tennis.

Introduction

In a sport context, we have limited understanding as to how deficits in intellectual functioning influence potential and performance in training and competition. Intellectual disability is the result of complex interactions between a person's intellectual functioning and his/her ability to use the conceptual, social and practical skills needed in meeting life demands (e.g., taking care of yourself, learning, communicating; AAMR, 2002). Intelligence, the basis for intellectual functioning, is a mental capability that is essential for reasoning, planning, solving problems, understanding complicated or abstract ideas, learning, and transferring learning from one situation to another.

One can expect that deficits in intellectual functioning are closely linked with a lower visual-spatial intelligence (Vickers, 2007). This could be a reason why table tennis players with ID would perform significantly worse compared to their generic peers on a table tennis specific test measuring tactical skills/visual-spatial intelligence.

Methodology and instruments

The data used in this study are derived from 39 athletes with intellectual disability (age = 28.3 yr \pm 7.3) and a reference group of 8 athletes without disabilities (age = 22.7 yr \pm 10.3).

The table tennis specific test consisted of a table tennis robot, dispensing 16 series of 15 serves to the player. The table tennis robot was adjusted so that each of the 15 balls within one series had the same speed, direction and spin. Four effects were used in all series: topspin (T), backspin (B), left sidespin (L) and right sidespin (R). For each player, the protocol consisted of 16 different series to be returned to a specified target (A4 paper size) on the other side of the table.

Results and conclusion

The results of this research show that the service-return accuracy of athletes with ID is poor compared to able bodied athletes. Elite athletes with intellectual disabilities are able to adapt their return according to specific spin characteristics of the serve, but this cognitive process progresses significantly faster in able bodied athletes.

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EUROPEAN BEST PRACTICES AND POLICIES FOR PROMOTION AND IMPLEMENTATION OF APA FOR ELDERLY–THENAPA II

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Introduction

Although there is some awareness about the benefits of physical activity and many of the issues regarding elderly persons (with and without a disability) are being discussed nowadays, there is still a long way to go to achieve full awareness and inclusion of older and especially older disabled people. The challenge is to expand the concept of an active lifestyle for all elderly persons.

Methods

During three years experts in the domain of ageing and disability from 27 European countries worked together to face this challenge. As a network THENAPA II developed a wide spectrum of products that facilitate the process of awareness rising in the domain of APA for the Elderly.

Results

The project has reviewed the information and statistics, gathered by all the partners on good practices and policies extending throughout Europe. This research made the identification and the fulfilment of relevant educational programmes in the students' curricula possible. In turn these programmes have to motivate students from different academic domains to work with and for the elderly population and at the same time – to help expand the concept of active lifestyle for the elderly.

In order to achieve the objectives of the project THENAPA II developed Recommendations to be proposed to the European Commission and its member states. The recommendations give the necessary information to all policy makers about the current situation of APA for elderly. The THENAPA II working group recommends that the European Commission and EU member states implement its findings under 3 different headings: (1) the policy, (2) research and/or education programmes and (3) the individual (elderly person with/without a disability).

To better serve the ultimate goal which is to motivate all older adults regardless their abilities to participate in different physical activities other products were developed – the motivational movies and resource cards. The DVD 'Never too old to be active, The joy of movement' which is accessible in 18 languages contains three motivational movies that are meant to convince elderly themselves to participate in Adapted Physical Activities. "Active Ageing Activity Cards" are an excellent tool for everyone who wants to organize an exercise session for older adults with or without disabilities. Those products complement each other; their specification gives a possibility to reach not only one type of end user, but a whole spectrum of other potential users.

TOWARDS EVIDENCE-BASED CLASSIFICATION IN PARALYMPIC SPORT – OVERVIEW OF THE ISSUES

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Key words: evidence-based classification, sport performance determinants.

In 2008, classification in disability sport is not evidence based. The determinants of sport-specific performance are not well understood, and, what is more, the causal relationship between sport-specific determinants and sport outcome has not been proven. The complexity of the research question is demonstrated in the model of sport proficiency developed by the Sport Science Committee of the IPC. According to that model, reaching an elite level in sport requires the transfer of physical potential, the firm execution of fundamental skills, and the ability to apply learning across different contexts, into sport-specific high-standard game or race situations. Disciplined practice and a sound athletic profile with a performance-driven attitude and personality will improve this acquisition process and enable the individual athlete to perform to their maximum potential. Environmental prerequisites, such as optimized quality of training and access to training and competition facilities, will facilitate this process.

The relationship of sport-specific determinants and sport outcome is further obscured by the diversity in impairment profiles of athletes with a disability. A fair number of studies have been conducted to describe performances of athletes in different classes. Some of these studies conducted detailed technique analyses in elite athletes to identify the optimal movement pattern to maximize performance. The optimal movement pattern characteristics were then related to the impairment characteristics of individuals within a specific class. While these studies are important they are of limited value for identifying an optimal technique because the participants in the studies all had impairments of body structures and functions and would therefore have selected techniques that would minimise the impact of their impairment on performance. In order to describe definitively optimal technique, the technique used by people with intact body systems and structures should be studied and described.

This presentation serves three purposes: 1) the outline of the conceptual framework of the evidence based approach in classification of athletes with a disability, which aims at minimizing the impact of impairment on the outcome of competition by classifying impairments according to the activity limitation they cause, 2) the introduction of two experiments conducted to understand the relationship between unrestricted body function and athletic performance (these experiments will be presented in separate oral presentations on wheelchair sprinting and seated shot put performance), and 3) the application of the concept to the eligibility issue of athletes with an intellectual disability (this application will be presented separately).

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PERFORMANCE DETERMINANTS IN WHEELCHAIR SPRINTING: A BASIS FOR A NEW ATHLETICS CLASSIFICATION SYSTEM IN DISABILITY SPORT

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Key words: biomechanics, functional potential, kinematics, wheelchair propulsion.

Introduction

Following the 2008 Beijing Paralympic Games, a new classification system will be officially implemented “to minimize the impact of impairment on the outcome of athletic competition by classifying impairments according to the activity limitation they cause”. The purpose of this study was to investigate the impact of trunk movement restrictions and the hand rim wheel size ratio as defining components in wheelchair sprinting.

Methodology

This project consisted of a maximal velocity study (VEL) and an acceleration study (ACC). Two groups of 15 male moderately active participants with no wheelchair propulsion experience completed 2 test series to establish test-retest reliability. Each test series was comprised of 20 sprint manoeuvres performed on a roller ergometer: 2 sprints with 5 varying movement restrictions (90-0, 90-45, 90, 0 and 45-0) using ADL wheels and track wheels. The sprint time for the ACC and VEL study were 10 and 20 seconds respectively. Paired T-test and Intraclass Correlation Coefficients (ICC) were calculated to assess test-retest reliability. ANOVA for repeated measures with a Tukey Post-hoc with maximal speed and mean acceleration in the first 3 seconds as dependent variables, and hand rim wheel size ratio and movement restriction as independent variables were used for the effect analysis.

Results

The sprint tests using ADL wheels were considered reliable although a training effect did occur in VEL. Regarding track wheels reliability, ICC for VEL data were rather low. As well, acceleration capacity was significantly lower during the retest possibly due to fatigue, muscle soreness and the occurrence of blisters. Maximal speed and acceleration capacity were significantly higher in 90-0 versus 90-45 and 90, and in 90-45 versus 90. As well, there were no differences between 90-0, 0 and 45-0. Regarding the hand rim wheel size ratio, maximal speed was higher using track wheels compared to ADL wheels. However, acceleration capacity was not different between both wheel sets.

Conclusion

These results indicate that upright movement restrictions lead to lower maximal speed generation and lower acceleration capacity, whereas the impact of prone movement restrictions remains unclear. In addition, data suggest that a higher hand rim wheel size ratio is associated with a lower maximal speed generation and a higher acceleration capacity. Further analyses are now necessary to investigate the relationship between trunk movement and movement restrictions, both in an able-bodied and a disabled population.

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THE ANALYSIS OF POSTURE BY MEANS OF A GEOMETRIC METHOD FOR THE DETERMINATION OF THE SIMMETRY LINE OF THE VERTEBRAL COLUMN

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Key words: postural analysis, symmetry line detection, reverse engineering.

Traditional techniques for posture and vertebral column detection, based on cutaneous marking, can be replaced with modern techniques based on 3D scanner. These techniques offer new detection and diagnostic capacities. Compared to other technologies and MR,I 3D scanners are not invasive, give accurate measurements with acceptable costs and allow that posture detection is not conditioned from instrument. The limits are due to the fact that the evaluations are included in those ones referable to what can be found from outside by means of the traditional estimative-experimental techniques. In fact, one of the most frequent problems is correlated to the body morphology: it can happen that a region of emisoma points out some gibbosities or alterations that can have no correlation with the column vertebral derivations and that can be due, merely, to defective or incorrect postural attitudes assumed by the subject because of algies or attitudes taken by daily working and/or sporting habits.

The geometric information related to the back of the patient, as those obtained after the acquisition by means of 3D scanner (point cloud), can not be directly used for posture analysis; data processing becomes, therefore, necessary in order to recognize the characteristic elements of the back. This configuration, based on outside detection, is given by the position of the vertebra spinal apophyses (symmetry line, S.L.); from this, taking into account the thickness of the soft parts that cover the vertebra, a spinal midline (S.M) could be determined.

The techniques for symmetry line recognition that have been developed in previous research activities, need to be tested in symmetry line detection from real subjects. This activity will be done and monitored by experimentations in which, properly selected subjects, will be involved. In particular the postures acquired from a sample of healthy subjects of both sexes and performing different physical and sport activities will be analysed. The proposed method for postural analysis will be compared with traditional techniques and the results will be critically discussed.

The persons who participated in the experiment were 80 students of the Faculty of Human Movement and Sport Sciences of the University of L'Aquila. The sample was not pre-selected. The experiment was conducted at the Design and Industria Method Laboratory of the Faculty of Engineering of the University of L'Aquila. Each participant replied to an informative questionnaire and personal data were treated according to the current law on privacy rights (L. 675/96, 1996). Each subject underwent a preliminary classical morfological postural test, done following the directives described in Raimondi et al. (2006).

The Digital acquisition of the back through 3D Scanprobe of points of precise form represented by the back of the person was performed in two postures, the most interesting in evaluating posture: the erect posture and the seated posture. The results obtained after Digital acquisition were elaborated and compared with those available in the literature. The comparison showed a good overlap that needs to be properly quantified and further validated in order to establish the relative percentage due to individual variability and the technical problems related to the 3D Scanprobe.



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